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A PRELIMINARY LOOK AT AVE-SESAME II CONDUCTED ON APRIL 19-20, 1979

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and Robert E. Turner

June 1980

NASA



*George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama*

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16. ABSTRACT This report contains information on data collected, synoptic conditions, and severe and unusual weather reported during the AVE-SESAME II period. The information presented is preliminary. The purpose of the report is to provide to researchers a preliminary look at conditions during the AVE-SESAME II period.			
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A PRELIMINARY LOOK AT AVE-SESAME II CONDUCTED
ON 19-20 APRIL 1979

1. OBJECTIVES AND SCOPE

The objective of the AVE-SESAME experiments was to gather meso-synoptic data for the purpose of investigating atmospheric structure and variability associated with convection and severe weather. A data base consisting of rawinsonde, surface, radar, aircraft, and satellite provides researchers with the tools necessary for analytical, conceptual, and numerical efforts to better understand the formation, development, and maintenance of severe local weather and the inter-relationships between convective activity and its environment.

This report contains information and a quick-look analysis of general weather conditions during the AVE-SESAME II period. Synoptic charts, radar maps, satellite photographs, rainfall amounts, and a summary of severe weather reports assembled from the NOAA weather wire and the national weather summaries are compiled for 1200 GMT ¹⁹ April through 1200 GMT ²⁰ April 1979. The purpose of this report is to provide to researchers a preliminary look at conditions during the AVE-SESAME II period to assist in analysis and interpretation of the data. Additional information has been presented by Alberty et al. (1979).

2. DATA COLLECTED

a. Rawinsonde Soundings

Rawinsonde soundings were collected at 23 National Weather Service stations and at 19 special stations. A list of these stations is given in Table 1, and their locations are shown in Fig. 1. The dates and

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Table 1. Rawinsonde stations participating in the AVE-SESAME II experiment.

Station Number	Location
<u>NWS Stations</u>	
229 (CKL)	Centerville, Al.
232 (BVE)	Boothville, La.
235 (JAN)	Jackson, Ms.
240 (LCH)	Lake Charles, La.
247 (GGG)	Longview, Tx.
255 (VCT)	Victoria, Tx.
260 (SEP)	Stephenville, Tx.
261 (DRT)	Del Rio, Tx.
265 (MAF)	Midland, Tx.
270 (ELP)	El Paso, Tx.
327 (BNA)	Nashville, Tn.
340 (LIT)	Little Rock, Ar.
349 (UMN)	Monett, Mo.
354 (OCK)	Oklahoma City, Ok.
363 (AMA)	Amarillo, Tx.
365 (ABQ)	Albuquerque, Nm.
433 (SLG)	Salem, Il.
451 (DDC)	Dodge City, Ks.
456 (TOP)	Topeka, Ks.
469 (DEN)	Denver, Co.
532 (PIA)	Peoria, Il.
553 (OMA)	Omaha, Ne.
562 (LBF)	North Platte, Ne.
<u>Special Stations</u>	
001 (ABI)	Abilene, Tx.
002 (BVO)	Bartlesville, Ok.
003 (COU)	Columbia, Mo.
004 (CDS)	Childress, Tx.
005 (CLL)	College Station, Tx.
006 (CNK)	Concordia, Ks.
007 (DUA)	Durant, Ok.
008 (FSM)	Fort Smith, Ar.
009 (GAG)	Gage, Ok.
010 (GLD)	Goodland, Ks.
011 (ICT)	Wichita, Ks.
012 (JCT)	Junction, Tx.
013 (MLU)	Monroe, La.
014 (MRF)	Marfa, Tx.
015 (MTX)	Morton, Tx.
016 (OTM)	Ottumwa, Ia.
017 (POF)	Poplar Bluff, Mo.
018 (RTN)	Raton, Nm.
019 (UOX)	Oxford, Ms.

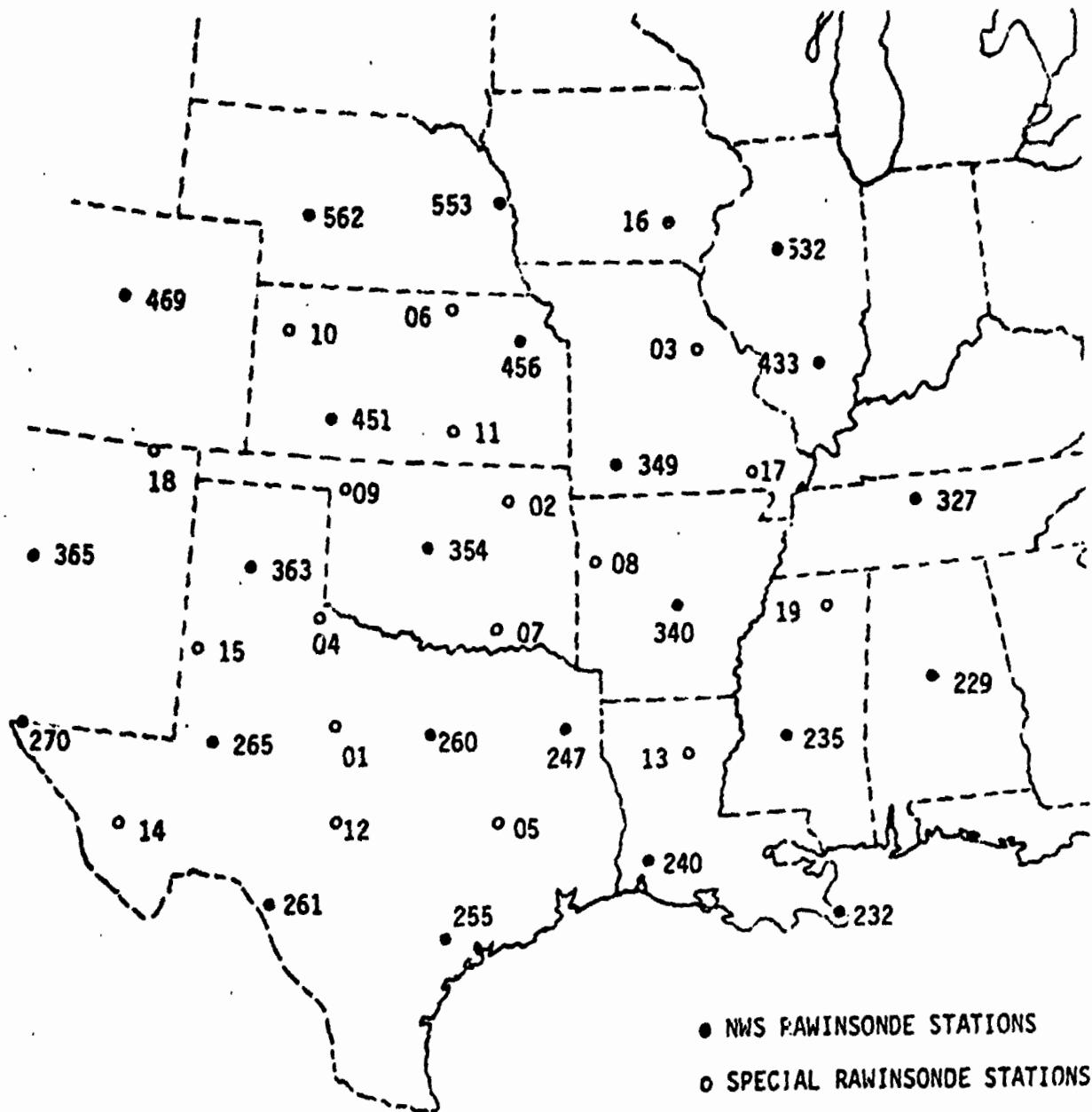


Fig. 1. Location of rawinsonde stations participating in the AVE-SESAME II experiment.

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scheduled sounding times are as follows:

<u>Date</u>	<u>Time (GMT)</u>
19 April 1979	12, 15, 18, 21
20 April 1979	00, 03, 06, 09, 12

Sounding data interpolated to 25-mb intervals will be presented in a separate document that is under preparation. These data may be obtained in hard copy form or on magnetic tape from the Atmospheric Sciences Division, Space Sciences Laboratory, NASA, Marshall Space Flight Center, Alabama 35812.

b. Surface and Upper Air

Surface and upper air charts and data are available from the National Climatic Center in Asheville, North Carolina.

3. SYNOPTIC CONDITIONS

a. Synoptic Charts

Surface and upper air charts for the AVE-SESAME II period are presented in Figs. 2-6. Surface charts are presented at 6-h intervals and upper-air charts at 12-h intervals. These charts have been analyzed using National Weather Service data only. They show the general conditions during the experiment and should not be used for other purposes.

At 1200 GMT 19 April 1979 a cold front oriented north-south extended from Central North Dakota through West Texas. A low-level tongue of moist unstable air parallel to the front pushed northward into western portions of Texas, Oklahoma, Kansas, and South-Central Nebraska as the day progressed. By 1800 GMT thunderstorms began to develop in West Texas and the panhandle as the front moved eastward lifting the moist air. This storm system developed in a "tornadic" air mass (dry wedge in mid-troposphere) resulting in the formation of hail, funnel clouds, and tornadoes. These storms showed high radar reflectivities,

especially following 2100 GMT. A second storm system developed far in advance of the front on the Central Texas Coastal Plains. This system caused torrential rains and severe flooding. As the system moved eastward into Southern Louisiana, several tornadoes and hail were reported. However, these tornadoes were weak, short-lived, and rope-like, and hail sizes were mostly less than an inch in diameter. Fog, poor visibility, and low ceilings made observations difficult. By 0000 GMT 20 April 1979 the cold front had moved into Central Kansas and Nebraska. As the moist unstable air moved in, additional severe weather developed. Tornadoes, hail, severe thunderstorms, and strong winds continued through 1200 GMT throughout Eastern Kansas and parts of Iowa and Missouri. By 1200 GMT, many south Texas cities still reported heavy rain and severe flooding.

b. Radar

Selected radar summary charts are presented in Figs. 7-23. These charts show areas of principal convective activity, heights of echoes, movement vectors, severe weather watch boxes, etc.

c. Satellite

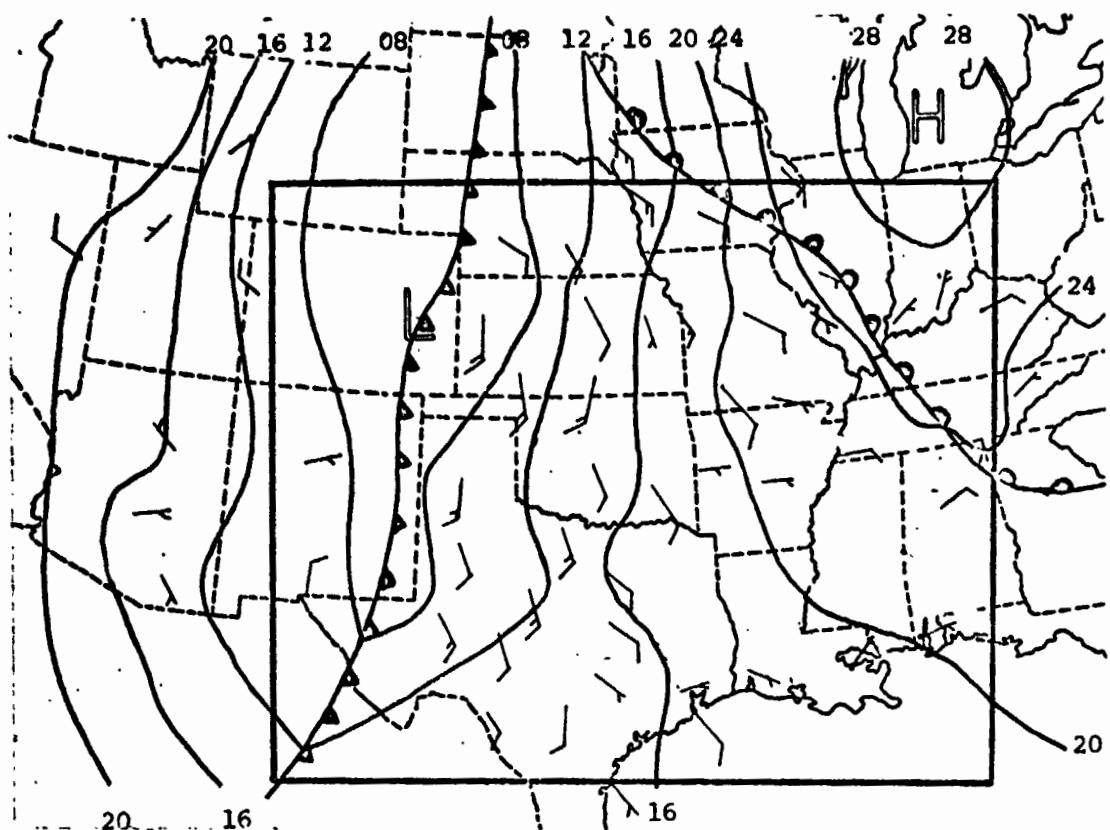
Satellite photographs were taken at 15-min intervals during the AVE-SESAME II period. These photographs consist of both infrared and visual. Selected satellite photographs for each hour during the period are presented in Figs. 24-46.

d. Rainfall

Rainfall data from the National Weather Service for the AVE-SESAME II period were totaled and analyzed. Isohyets of rainfall in inches are presented in Fig. 47. This analysis utilizes only data from National Weather Service stations.

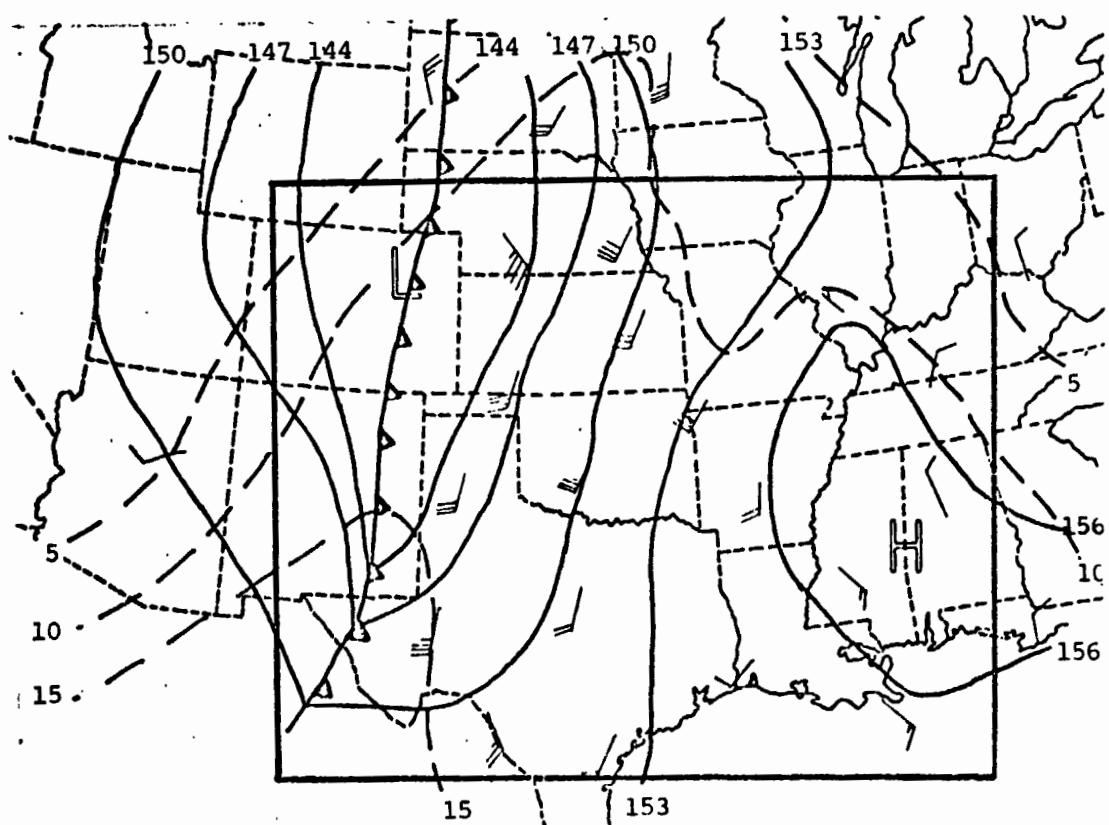
4. UNUSUAL AND SEVERE WEATHER REPORTED

The severe weather outbreak during AVE-SESAME II was a combination of two different types of severe weather systems. Reports of tornadoes, severe thunderstorms, hail, torrential rain, and flooding were compiled for the AVE-SESAME II period from the NOAA weather wire and national weather summaries when available and are presented in Table 2. Locations of observed tornadoes, observed funnel clouds, radar-indicated tornadoes, hail, and thunderstorms are shown in Fig. 48. A total of seven tornadoes and five funnel clouds occurred from Nebraska to the Texas Panhandle. Hill City, Kansas, reported four tornadoes and three funnel clouds all within an 80-km (50-mi) radius. Tornado damage was reported in Colby, Kansas. Baseball-size hail was reported in the eastern Texas Panhandle, with smaller size hail in other areas. Torrential rains and severe flooding occurred in Southeast Texas and Western Louisiana. One cooperative climatology station in Beaumont, Texas, reported over 7 inches of rain during the AVE-SESAME II period. Many low-lying areas and communities near the coast were completely inundated, resulting in millions of dollars of damage. A number of funnel clouds and three tornadoes also were reported in this area--two near Beaumont, and the third in Houston. Golfball-size hail was observed near Uvalde, Texas. AVE-SESAME II proved to be a highly successful experiment for the study of severe weather systems.



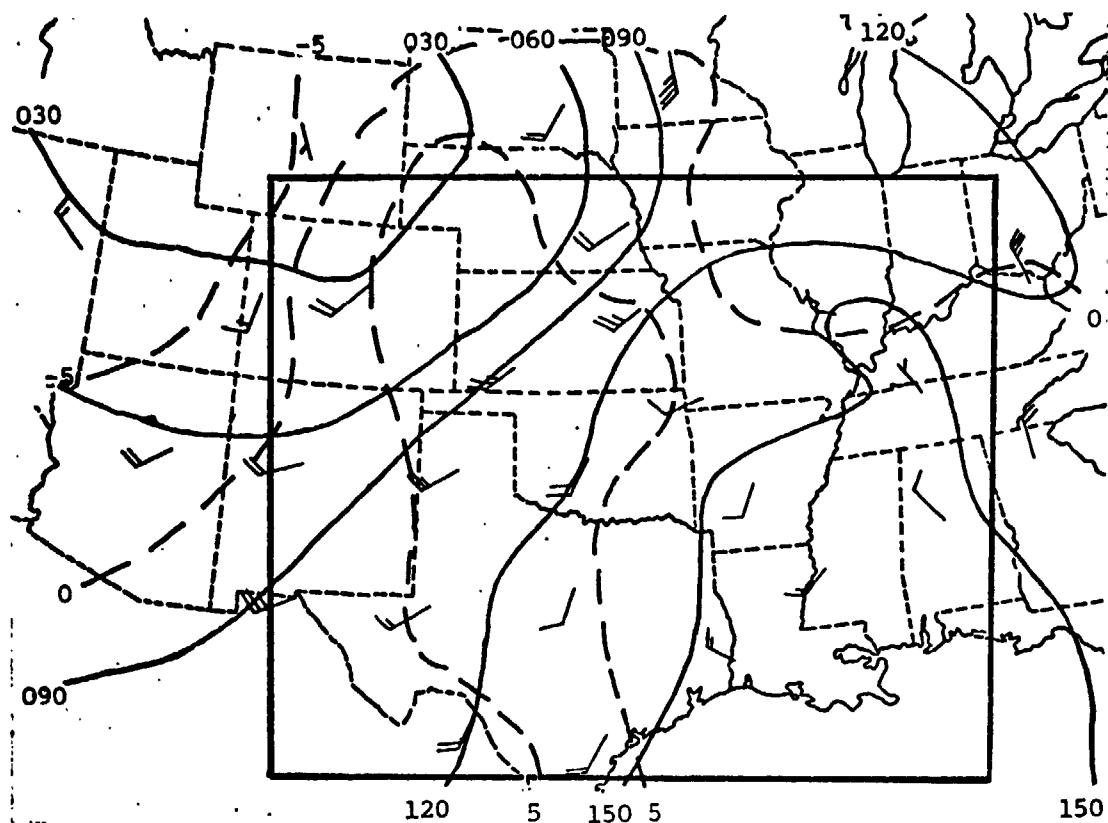
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(a) Surface

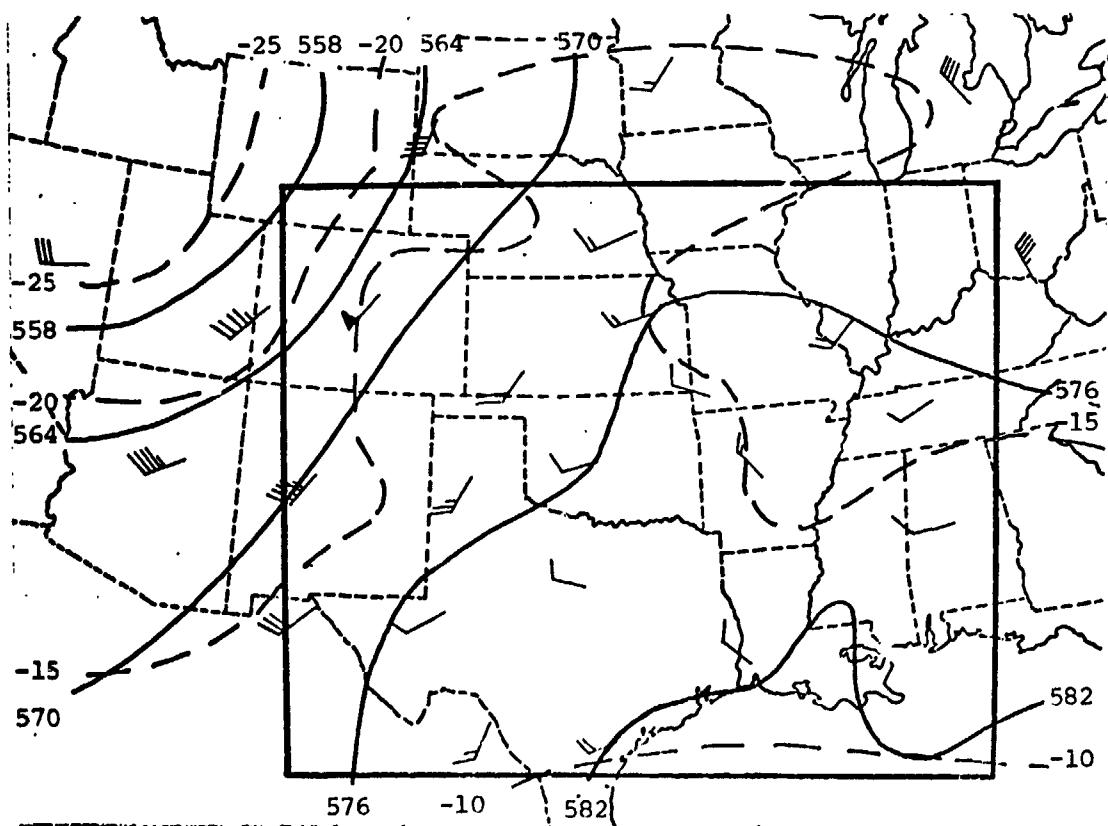


(b) 850 mb

Fig. 2. Synoptic charts for 1200 GMT 19 April 1979.

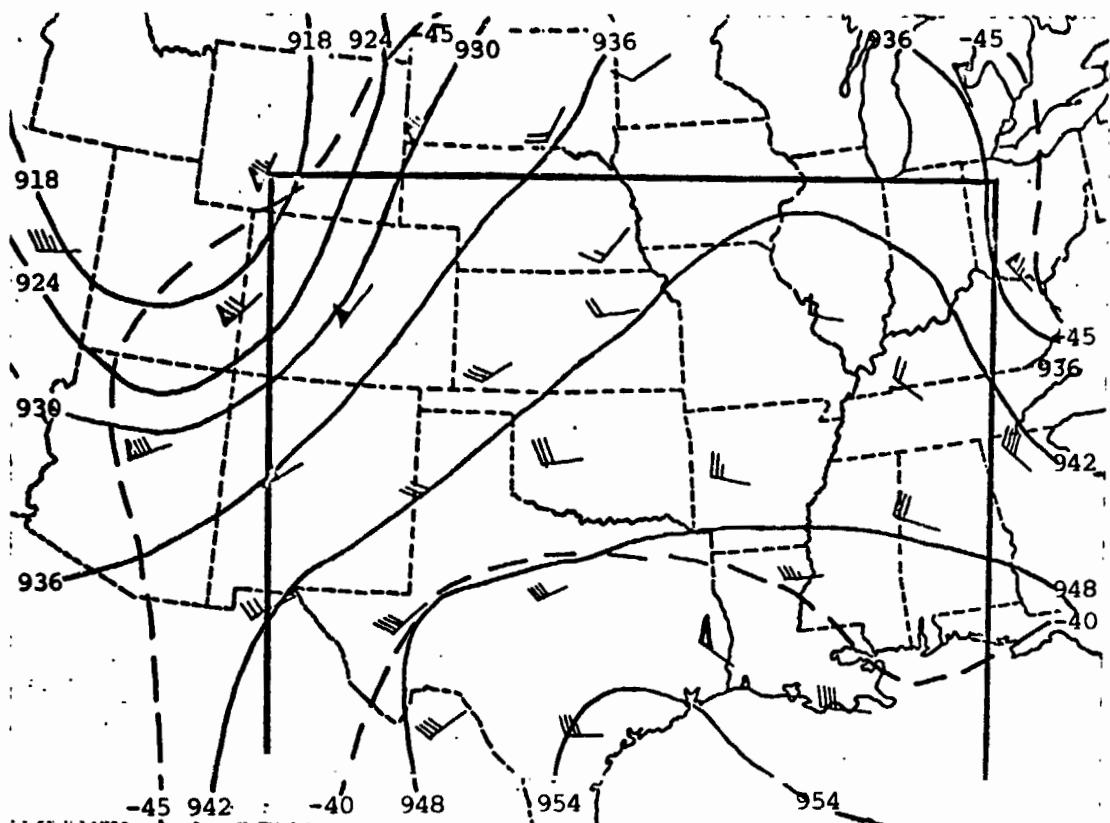


(c) 700 mb

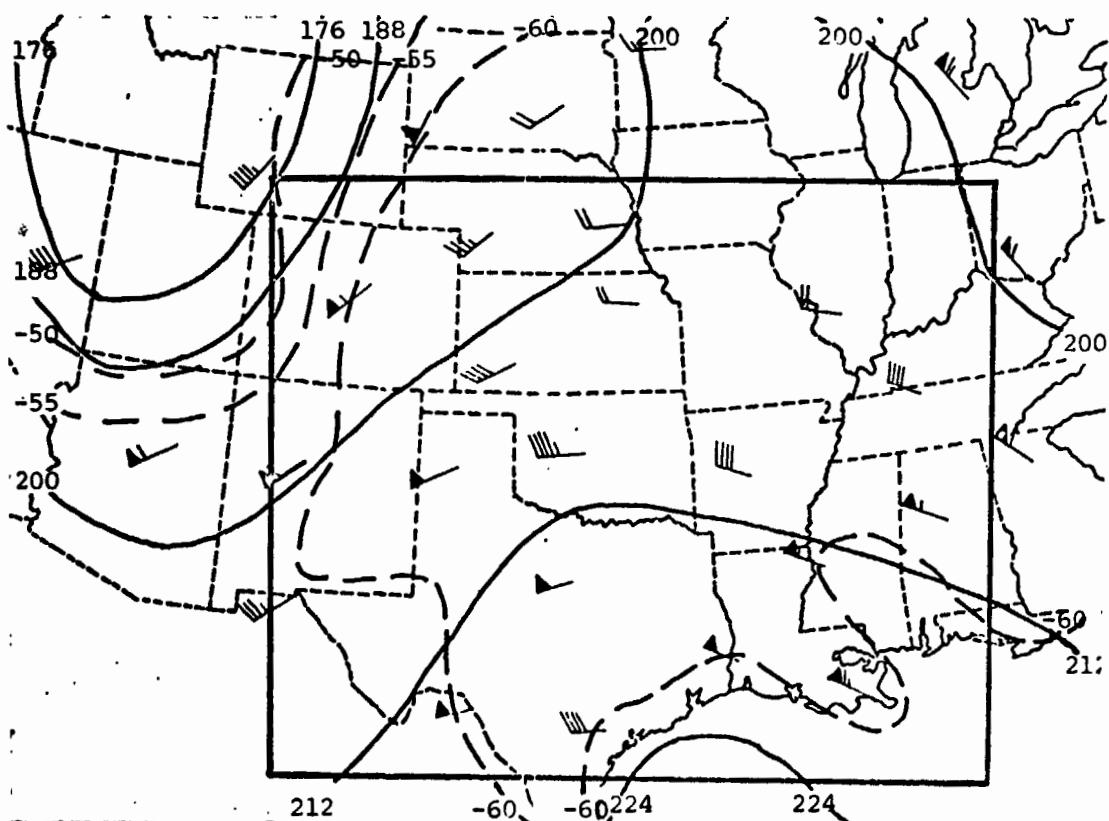


(d) 500 mb

Fig. 2. Continued.



(e) 300 mb



(f) 200 mb

Fig. 2. Concluded.

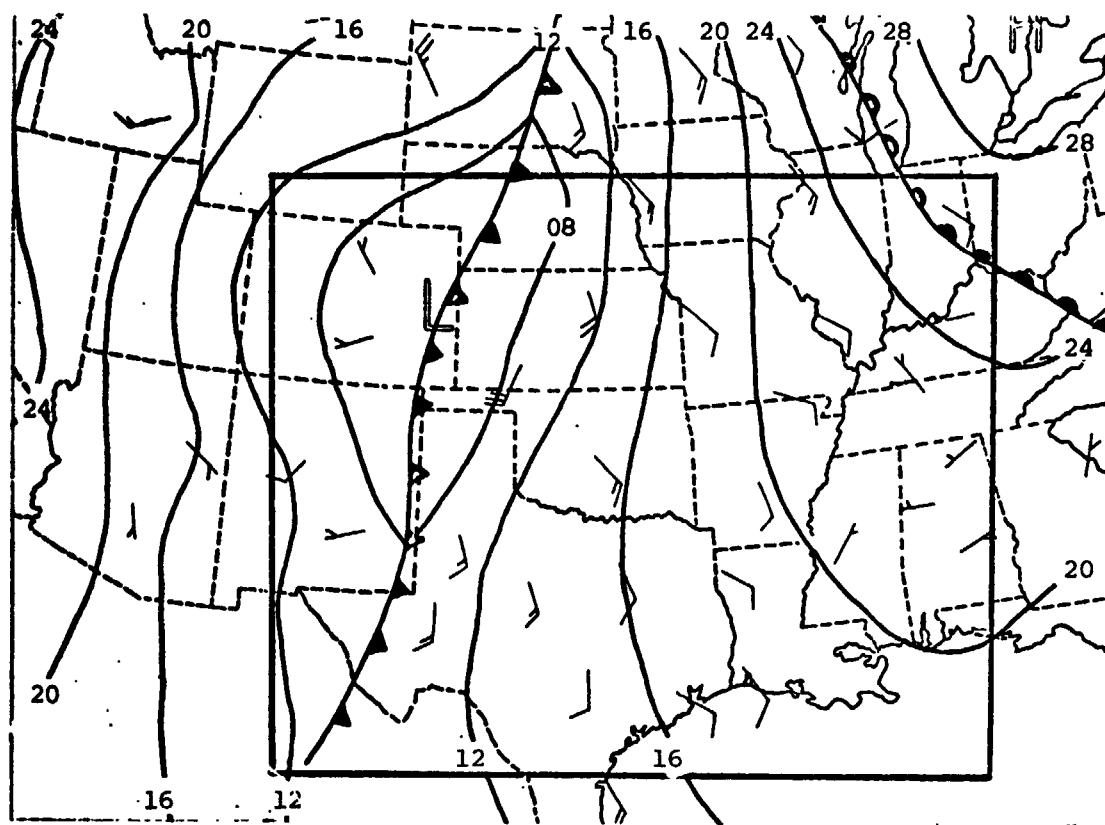
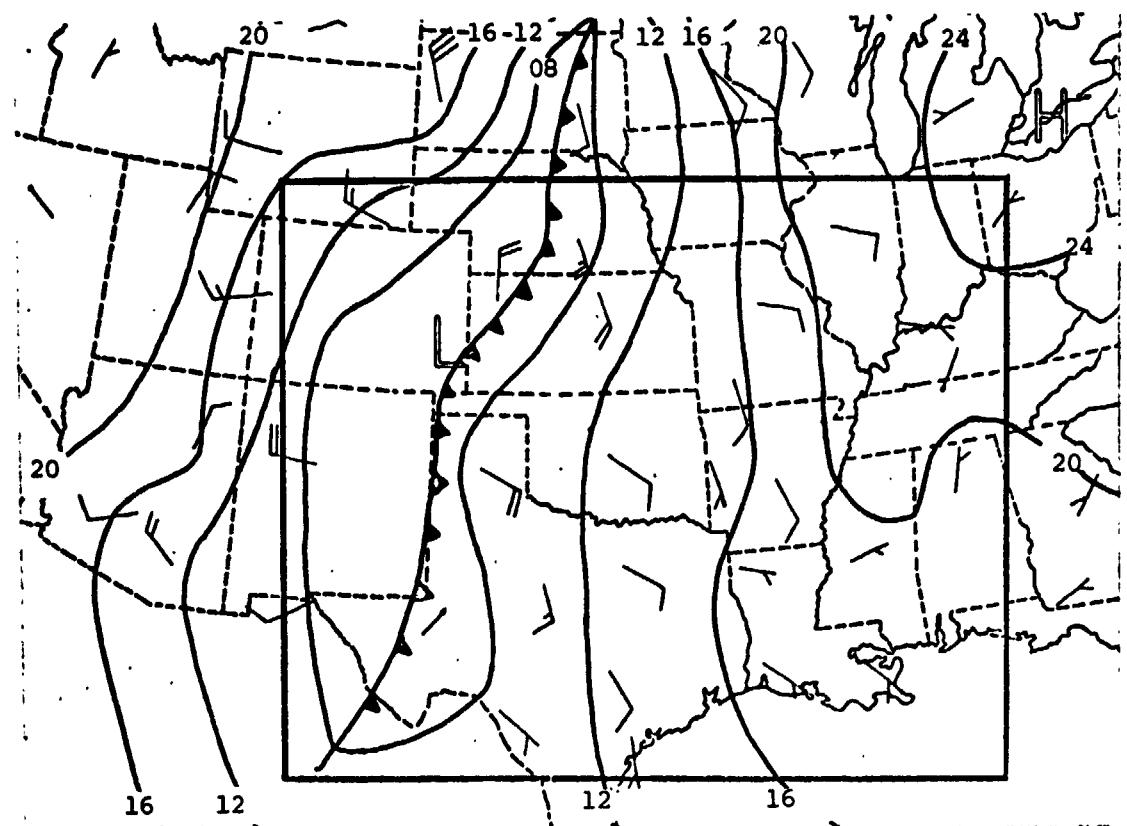
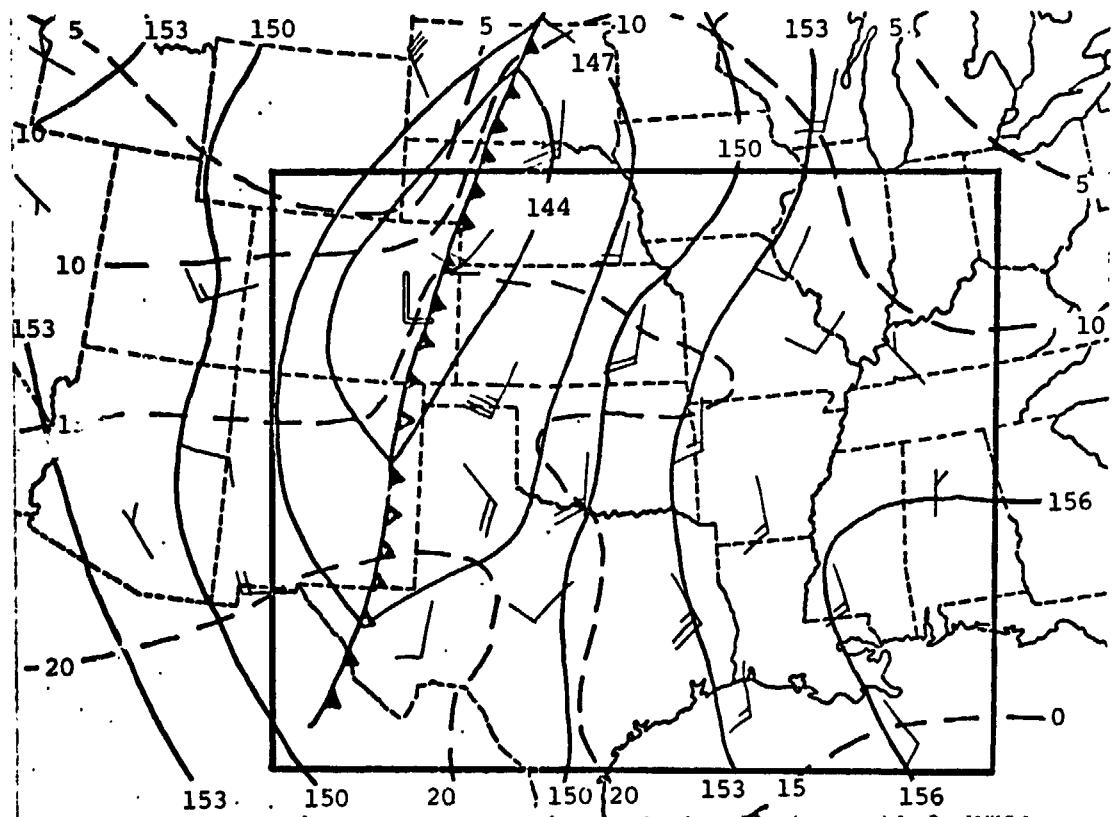


Fig. 3. Surface chart for 1800 GMT 19 April 1979.



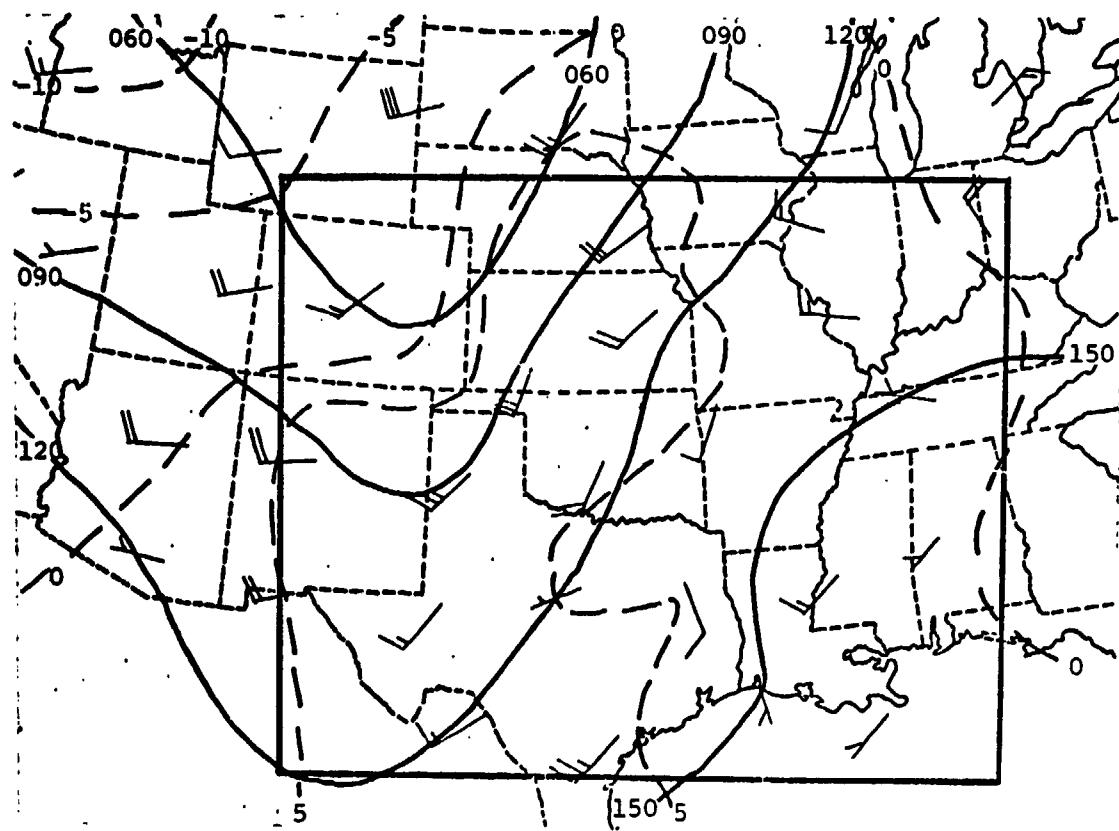
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(a) Surface

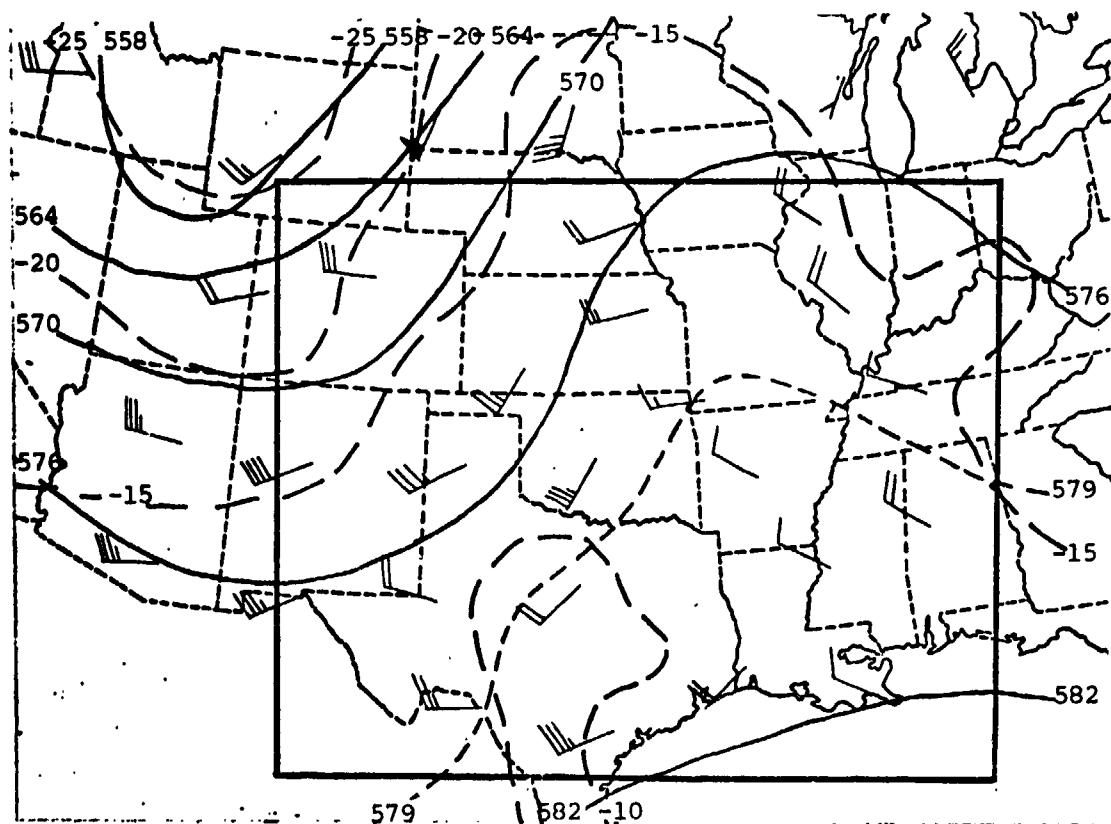


(b) 850 mb

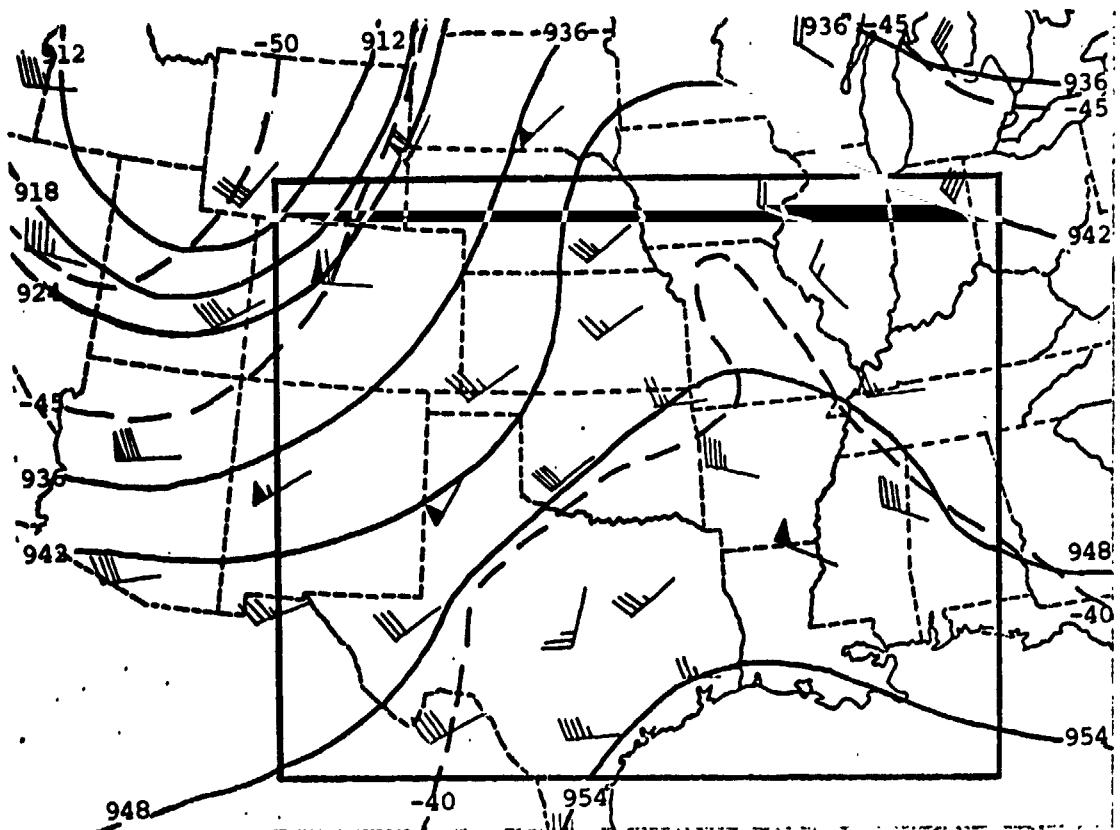
Fig. 4. Synoptic charts for 0000 GMT 20 April 1979.



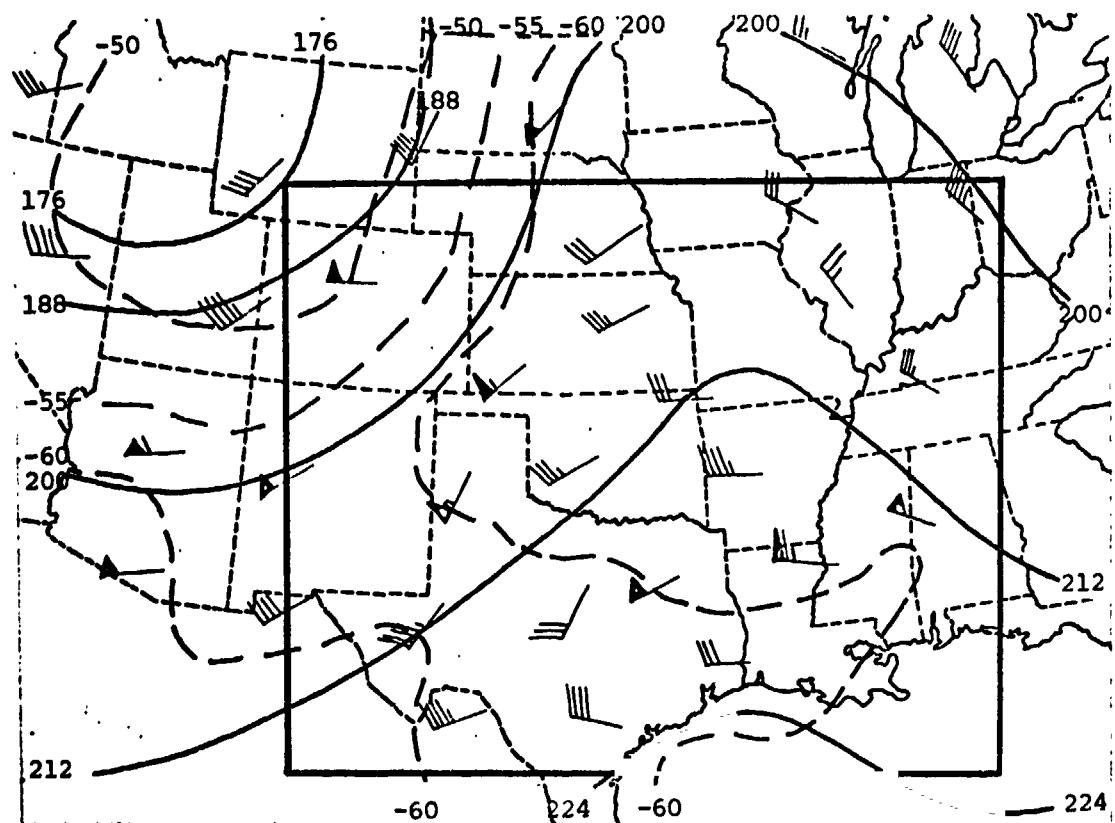
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Fig. 4. Continued.



(e) 300 mb



(f) 200 mb
Fig. 4. Concluded.

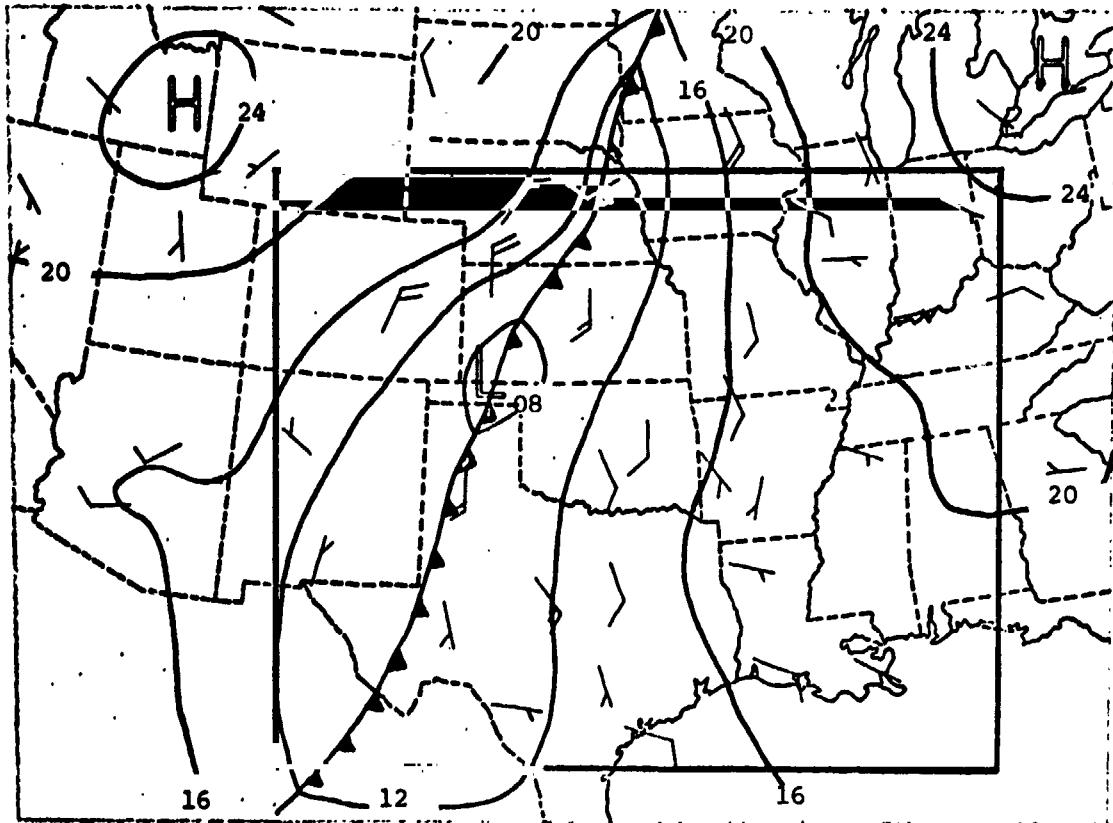


Fig. 5. Surface chart for 0600 GMT 20 April 1979.

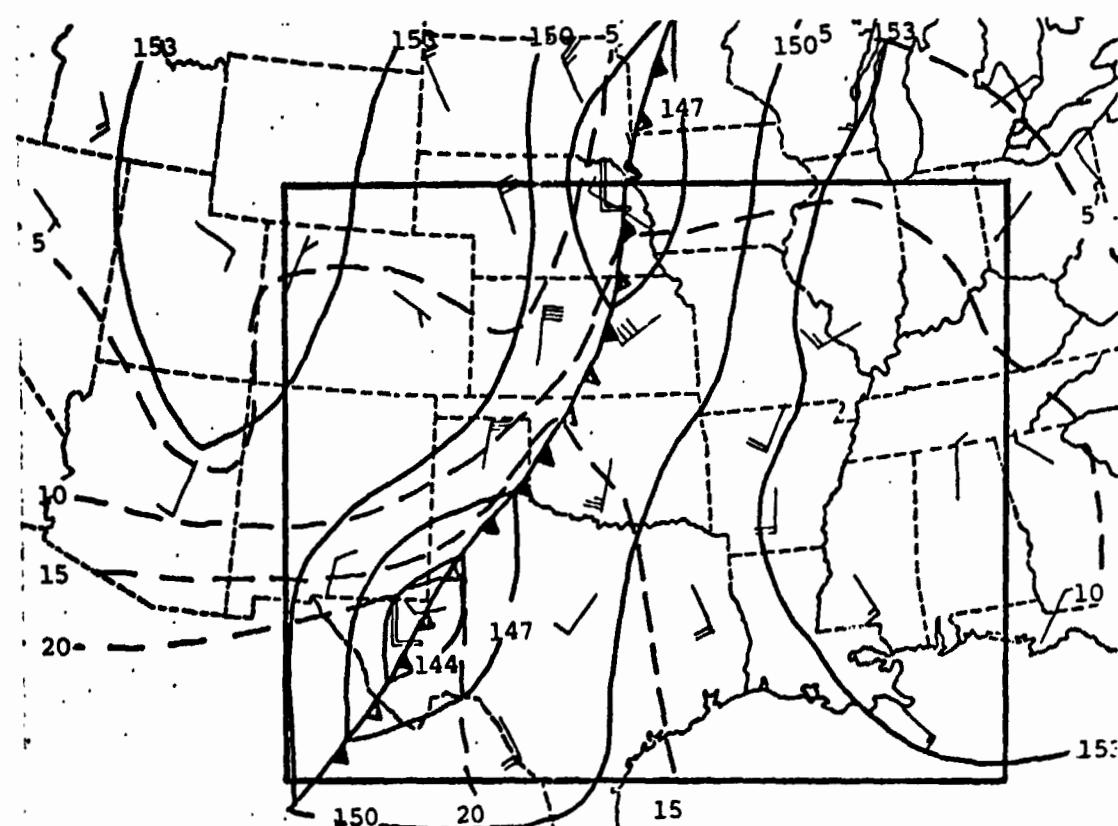
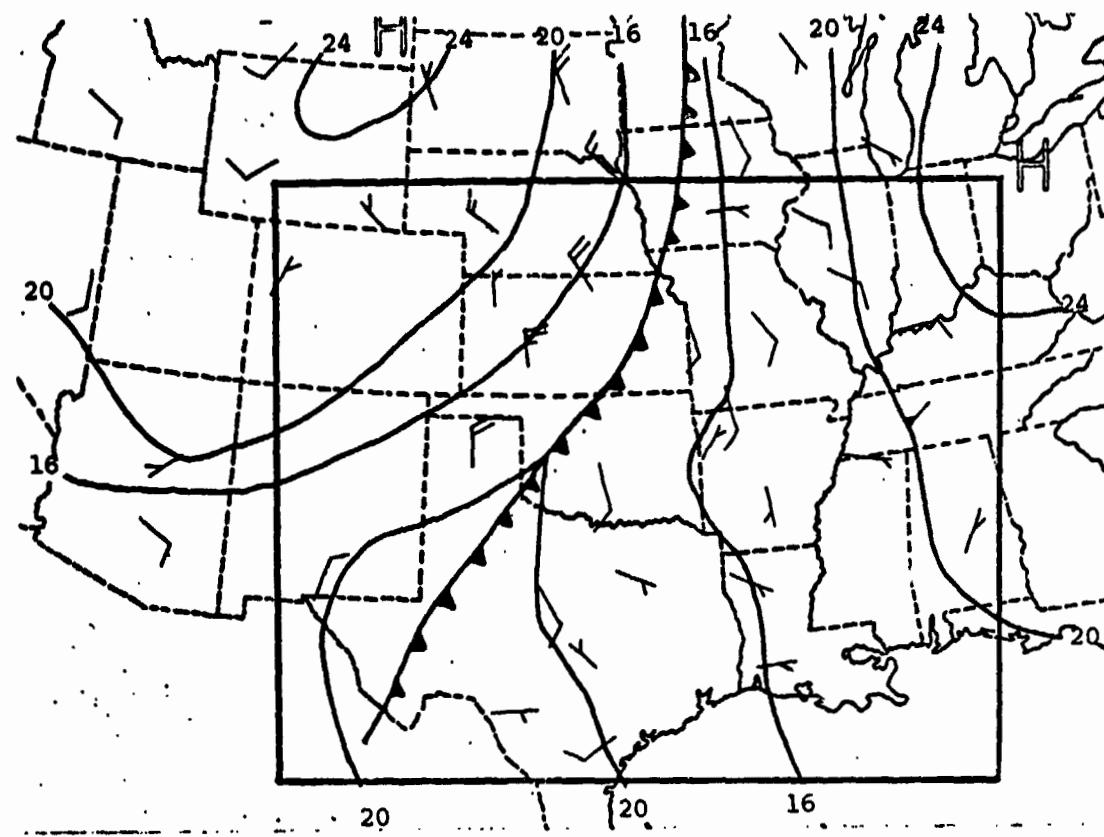
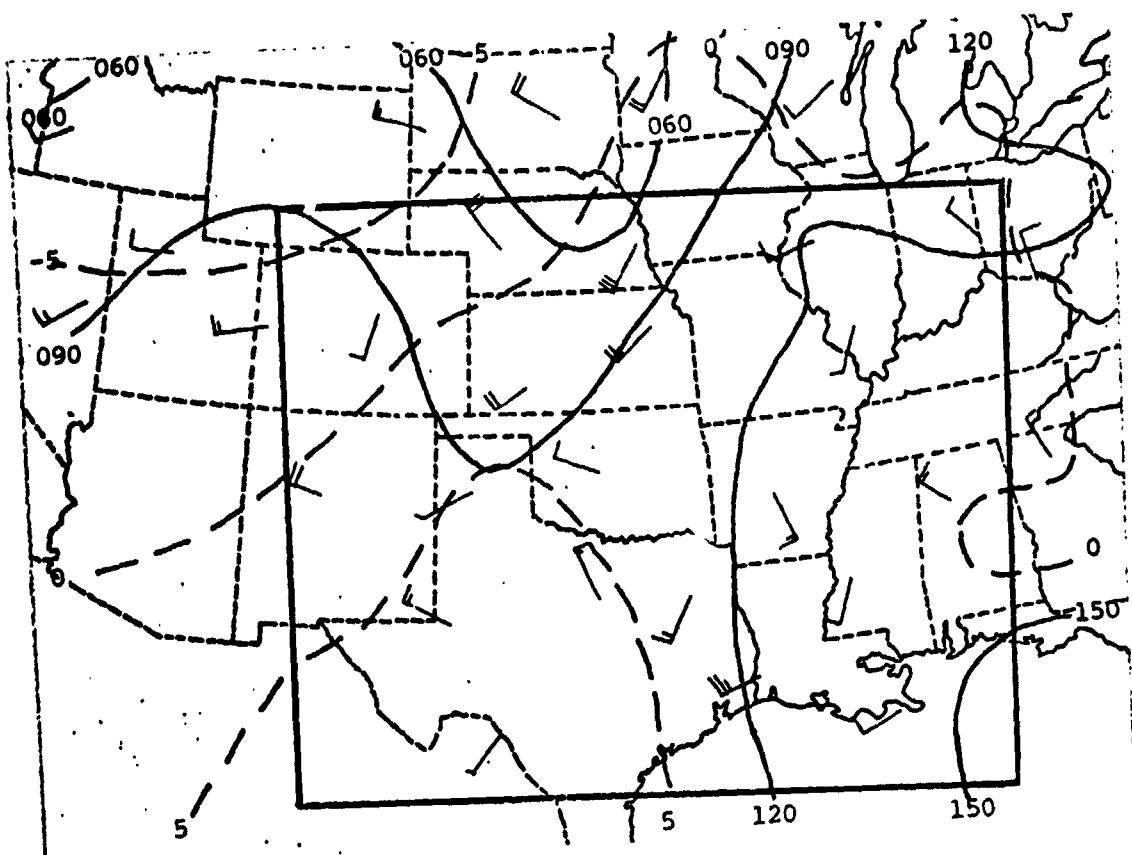
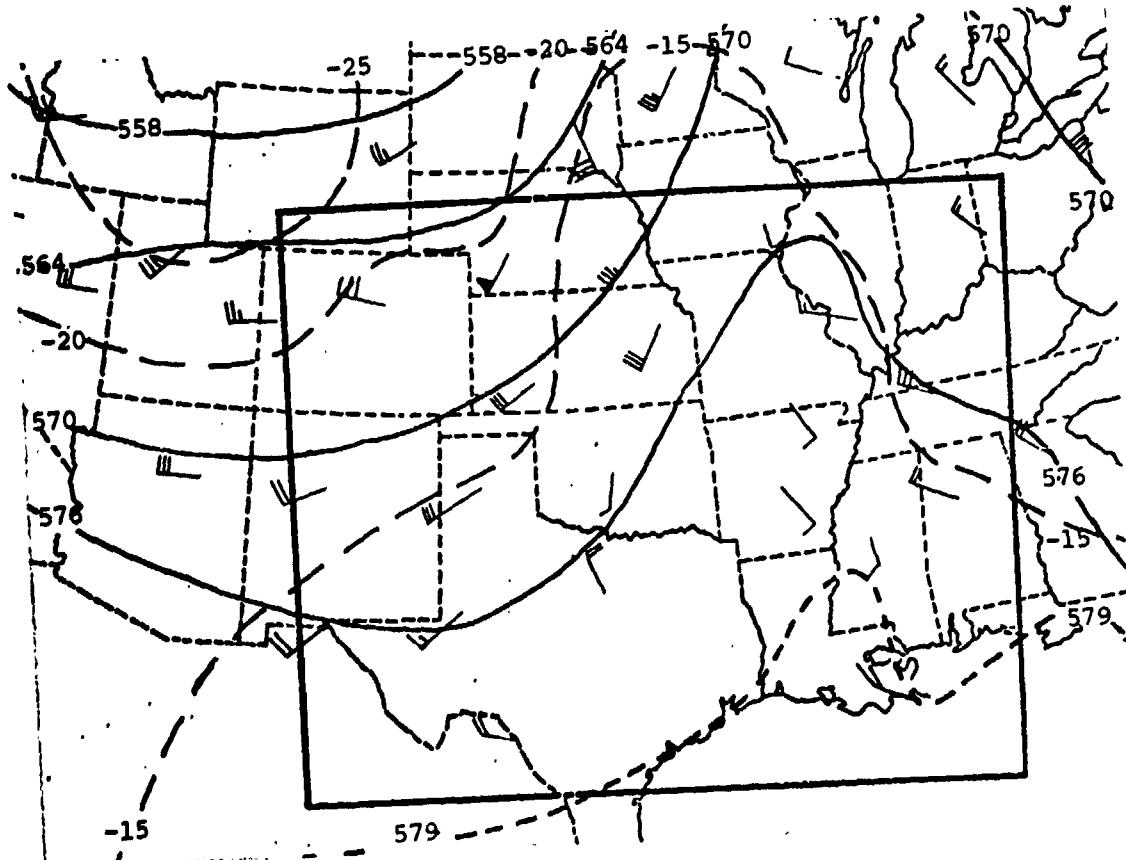


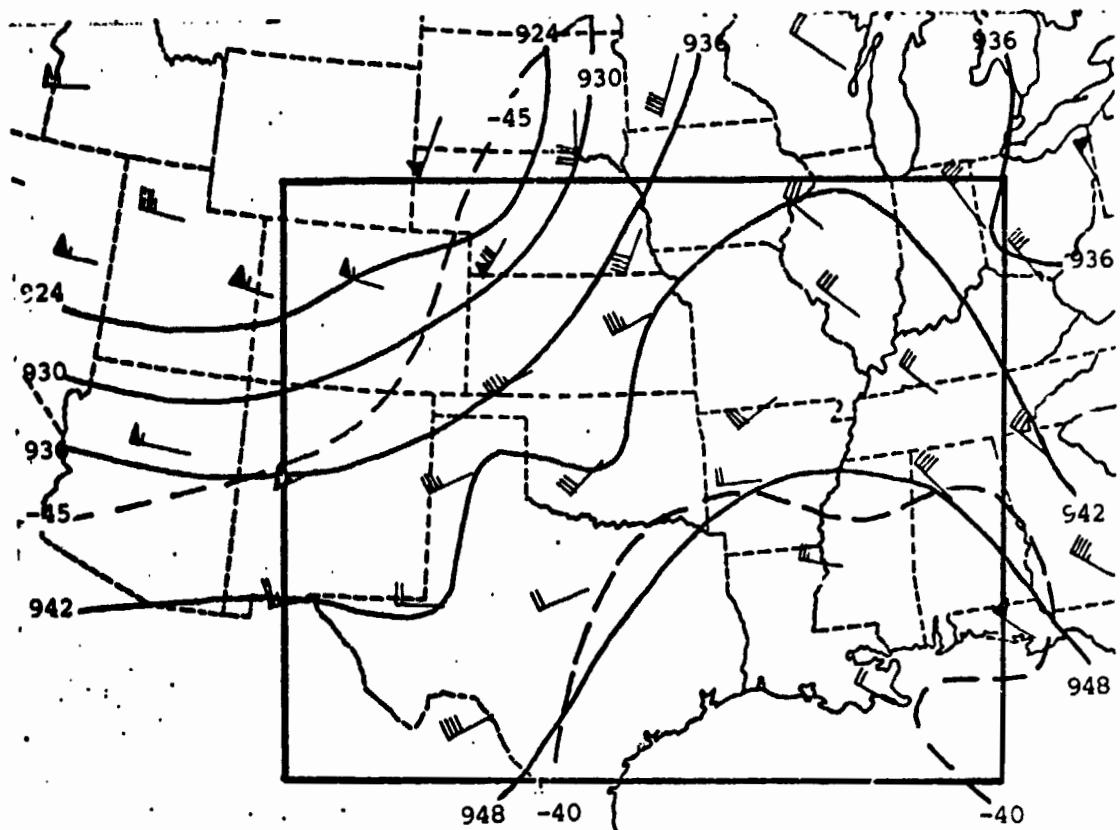
Fig. 6. Synoptic charts for 1200 GMT 20 April 1979. ORIGINAL PAGE IS OF POOR QUALITY.



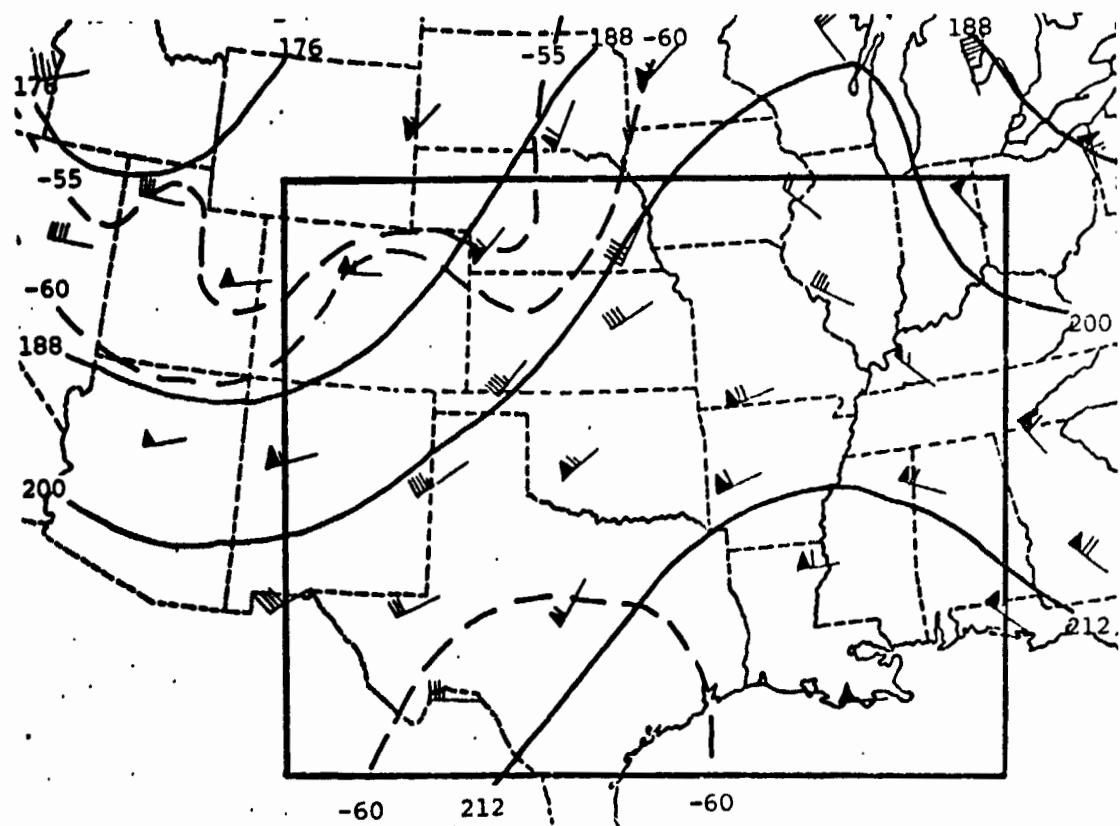
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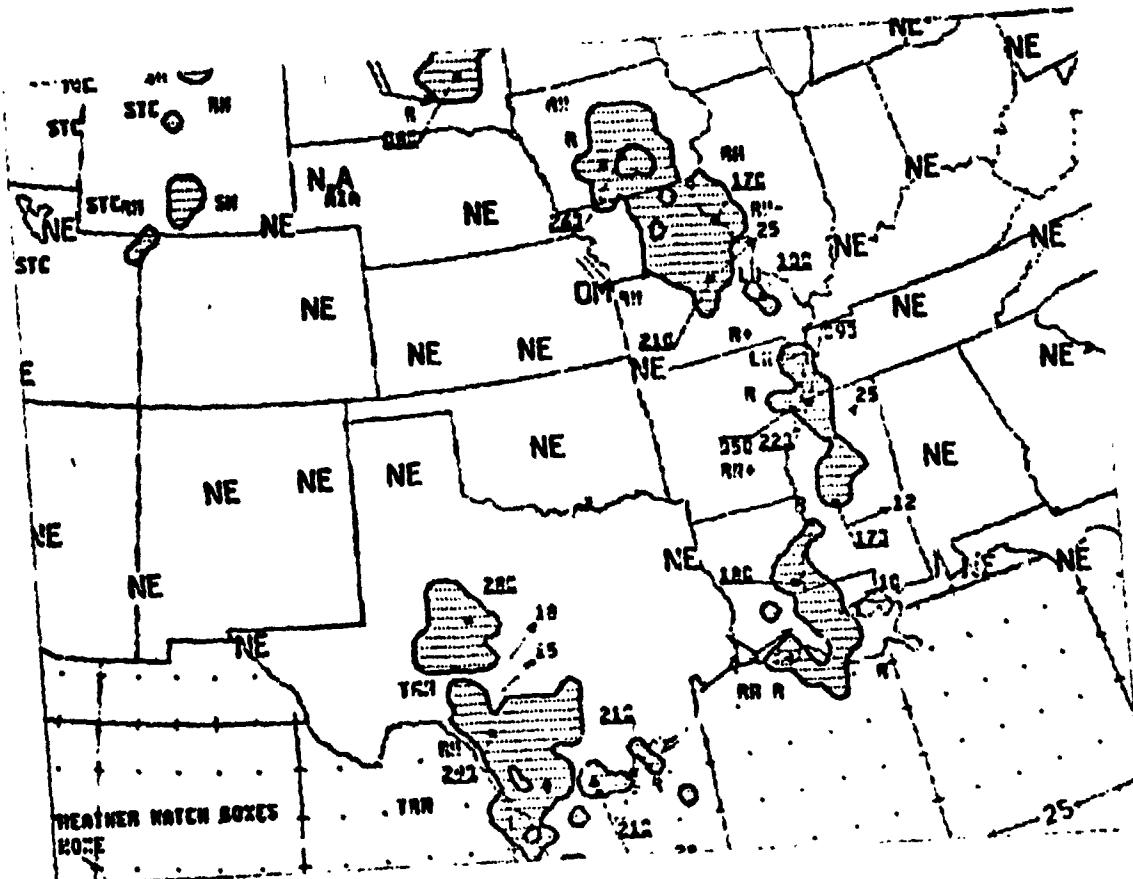


Fig. 7. Radar summary for 1135 GMT 19 April 1979.

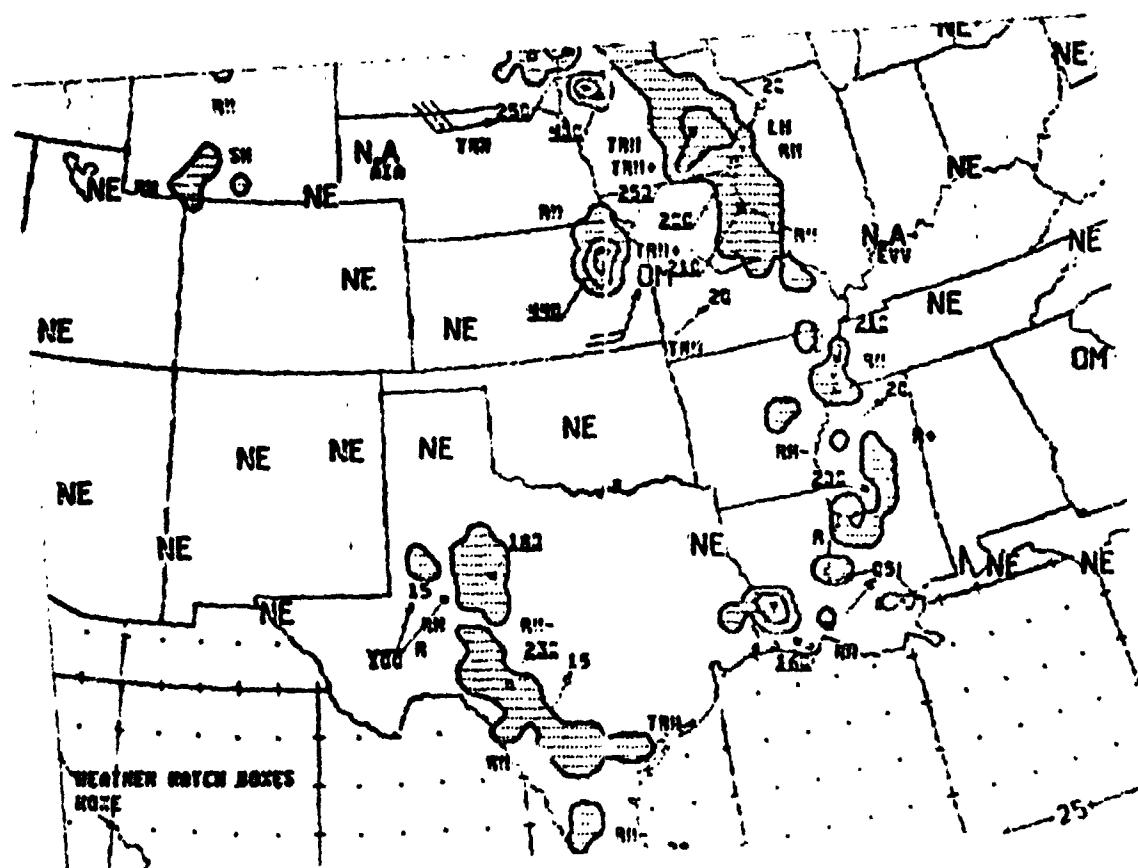
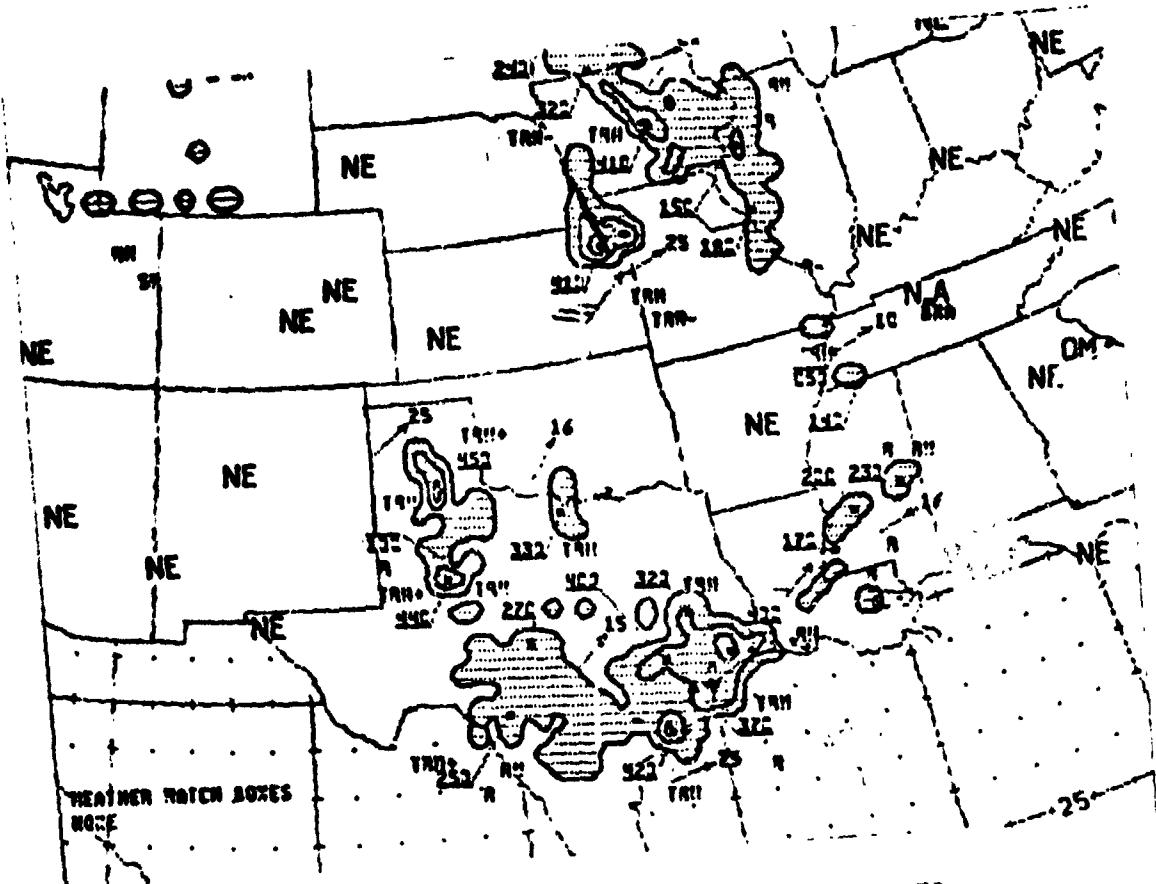


Fig. 8. Radar summary for 1435 GMT 19 April 1979.



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Fig. 9. Radar summary for 1735 GMT 19 April 1979.

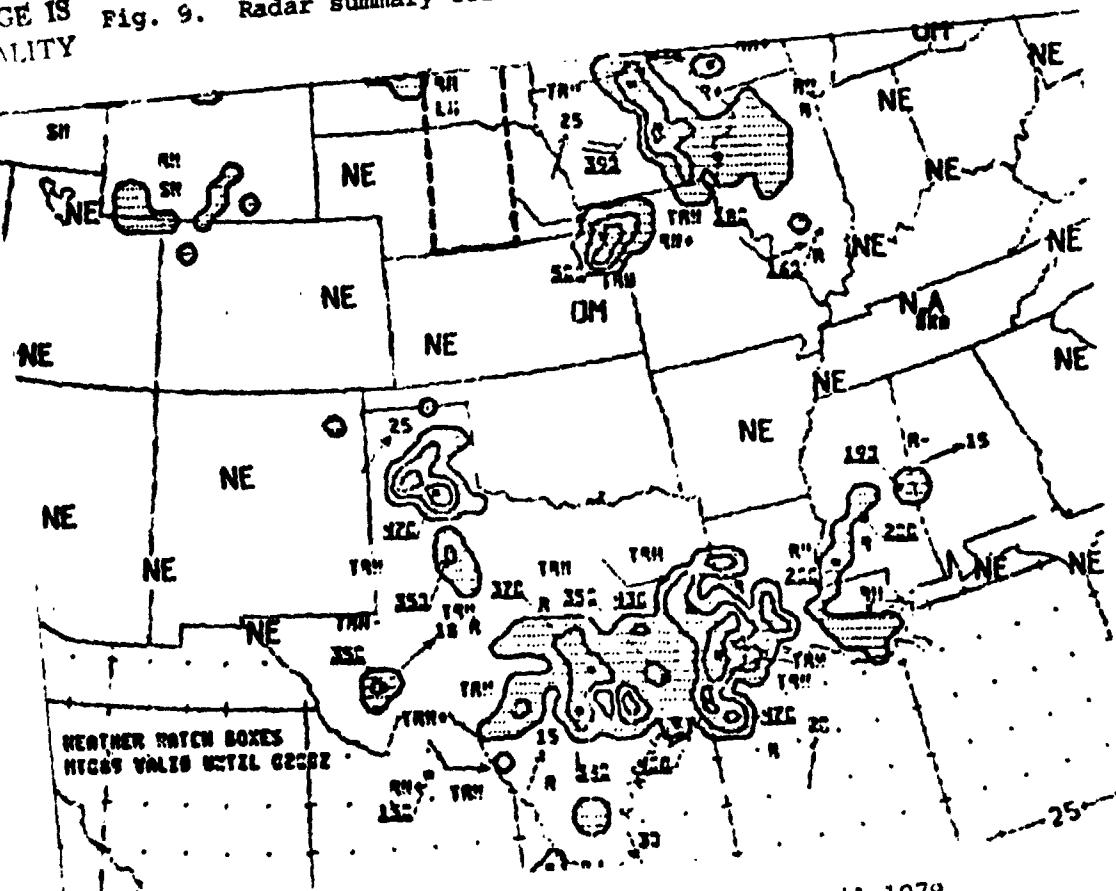


Fig. 10. Radar summary for 1935 GMT 19 April 1979.

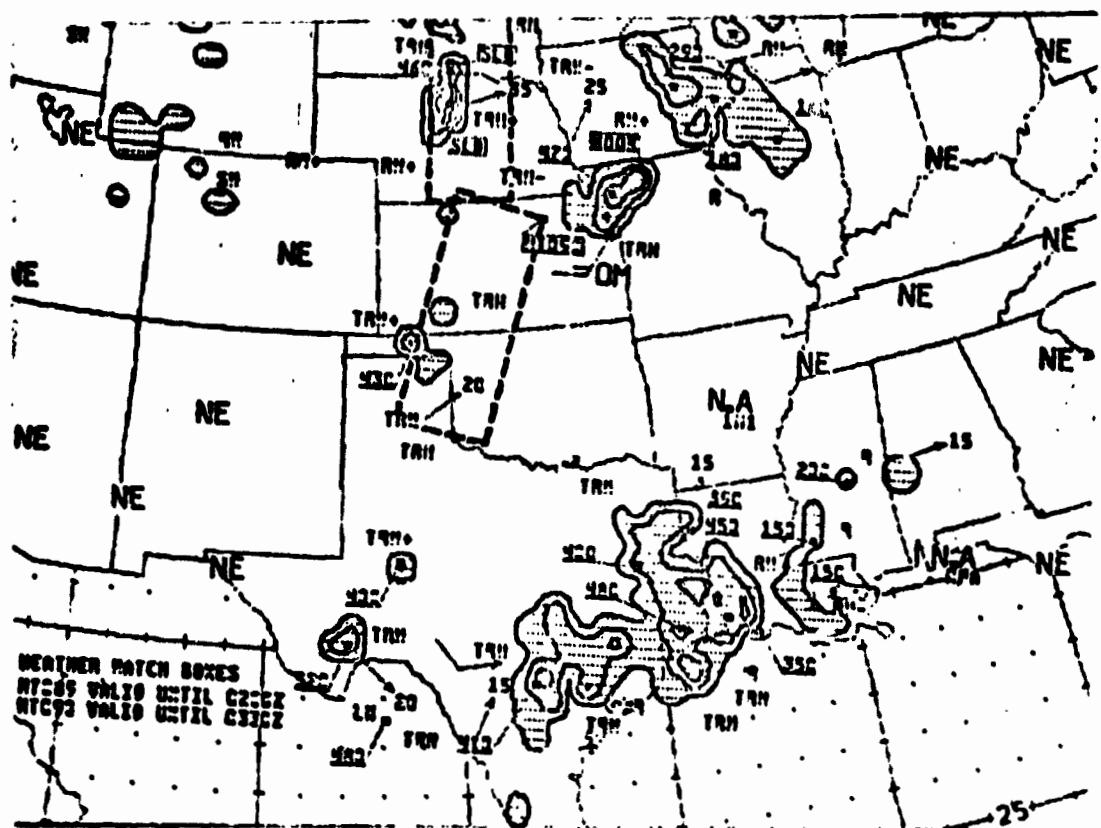


Fig. 11. Radar summary for 2035 GMT 19 April 1979.

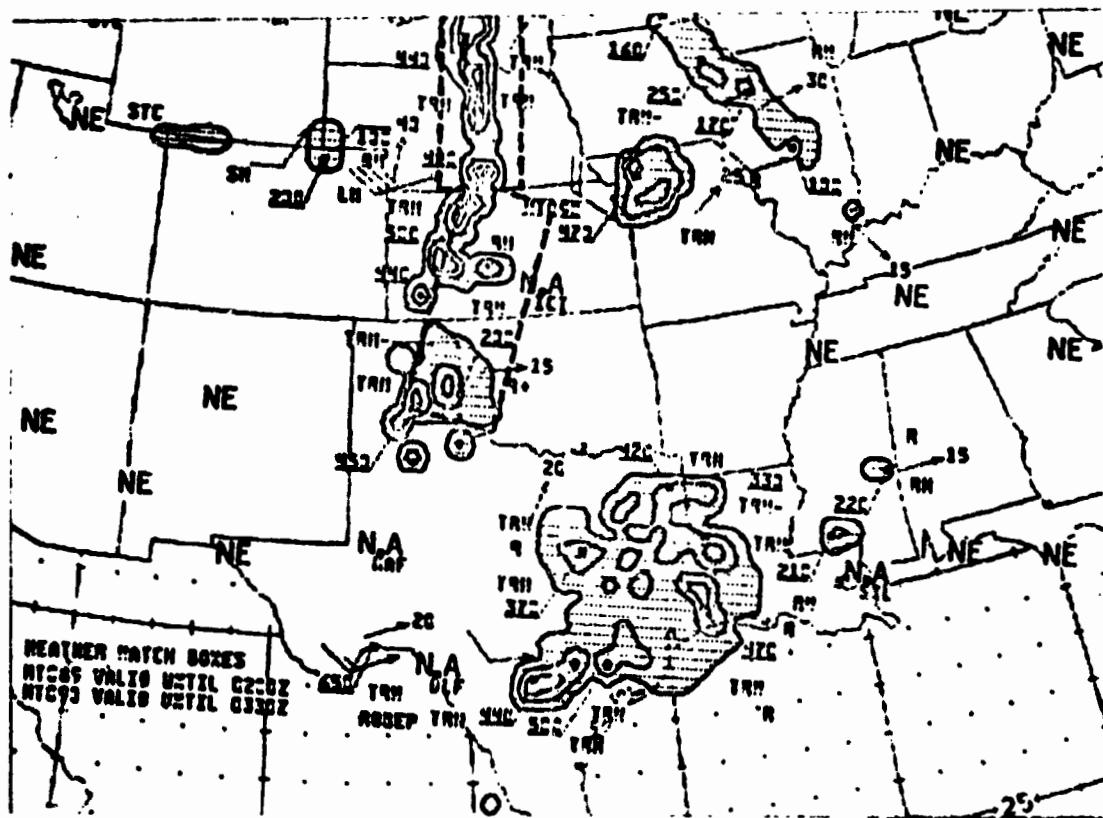


Fig. 12. Radar summary for 2235 GMT 19 April 1979.

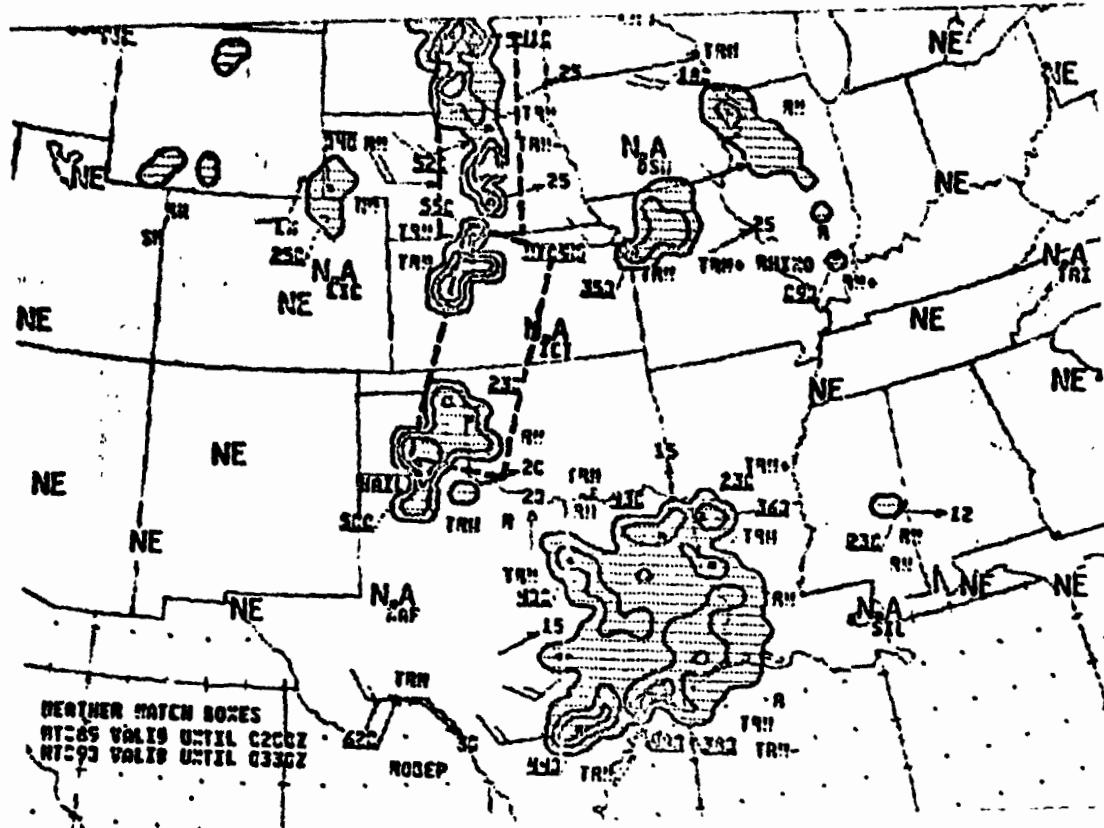


Fig. 13. Radar summary for 2335 GMT 19 April 1979.

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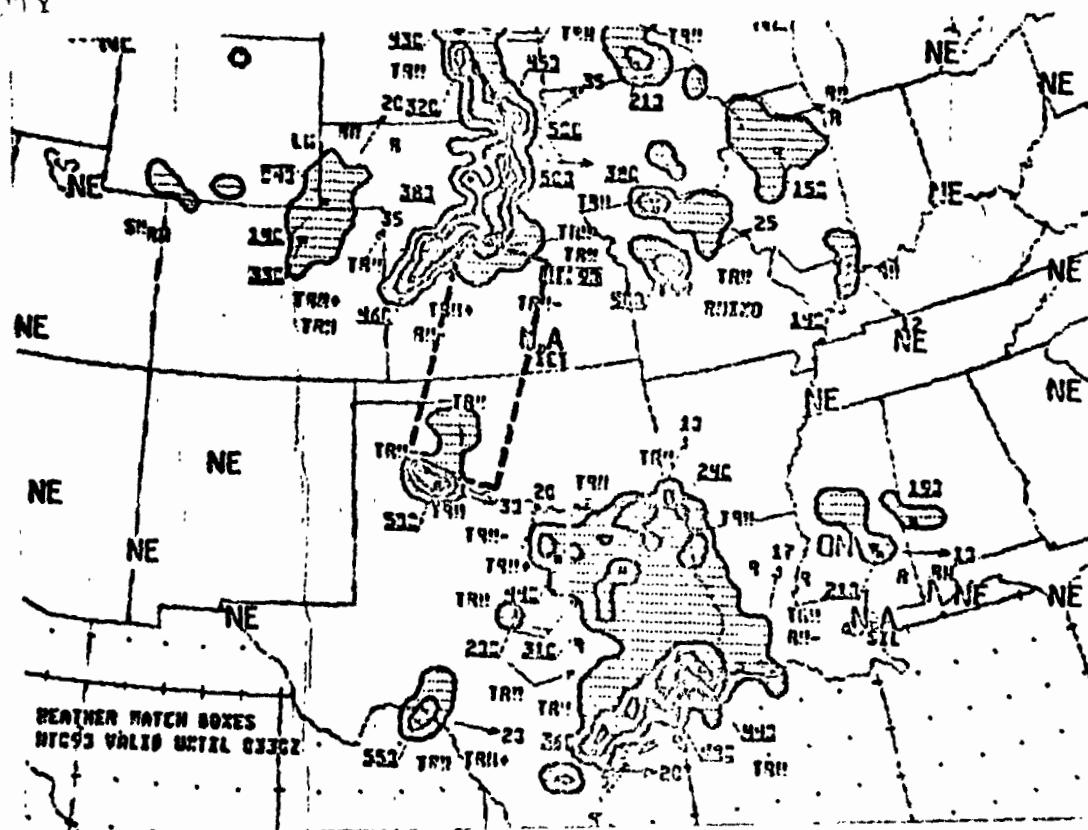


Fig. 14. Radar summary for 0135 GMT 20 April 1979.

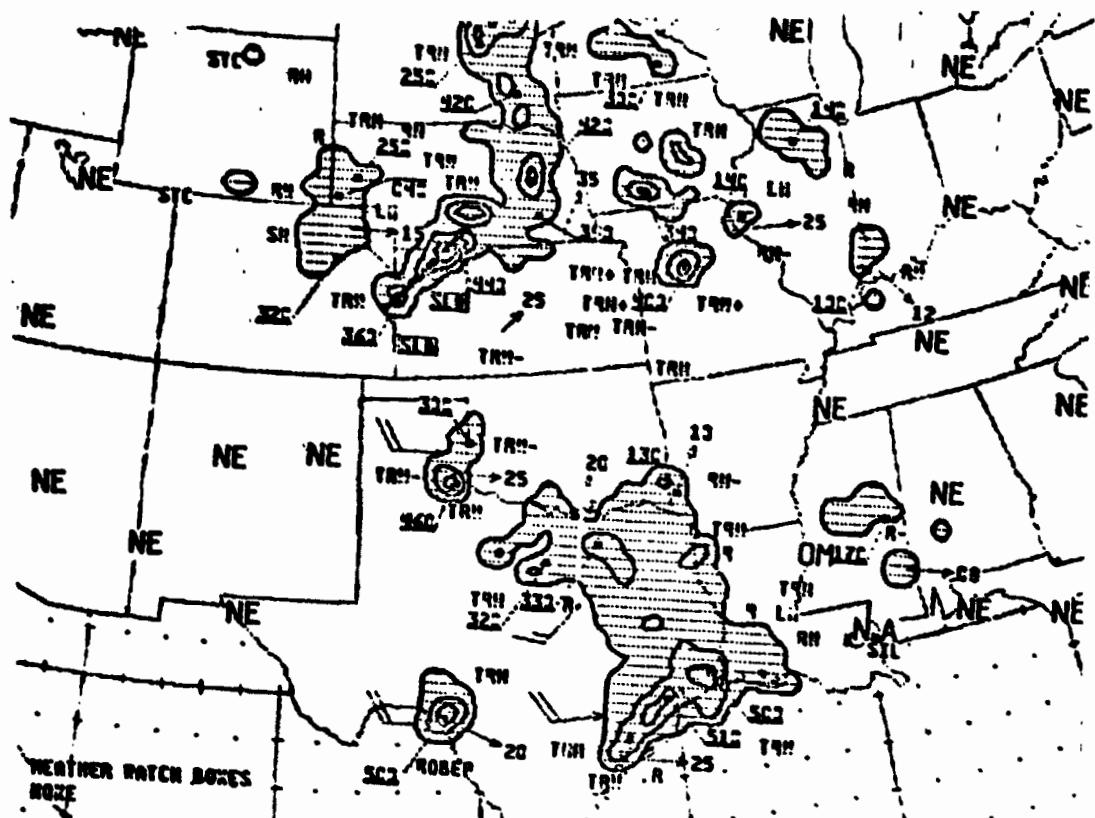


Fig. 15. Radar summary for 0235 GMT 20 April 1979.

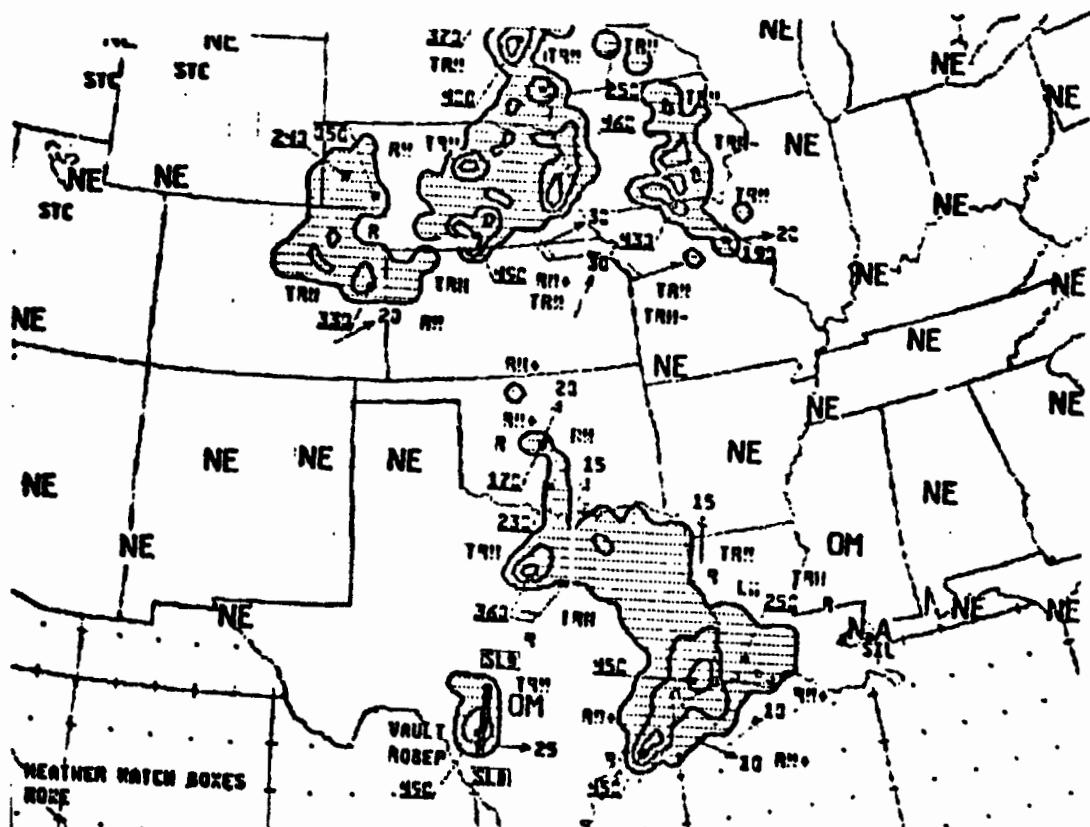


Fig. 16. Radar summary for 0435 GMT 20 April 1979.

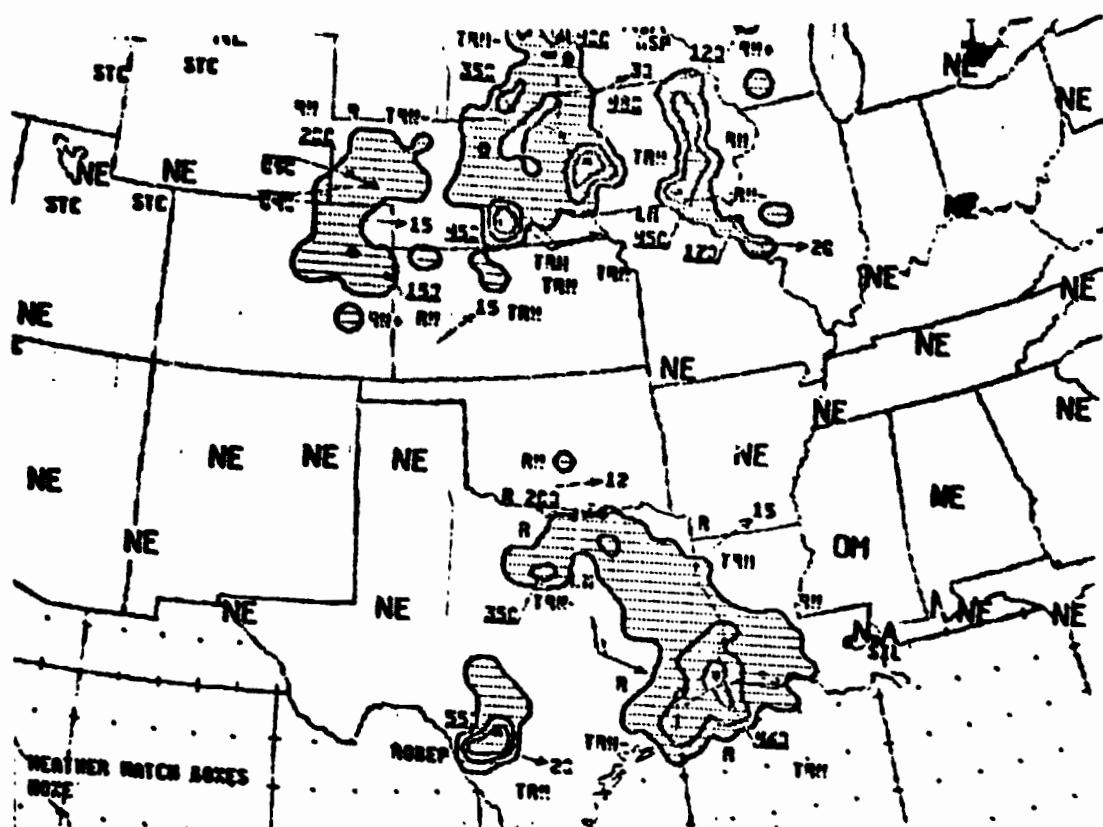


Fig. 17. Radar summary for 0535 GMT 20 April 1979.

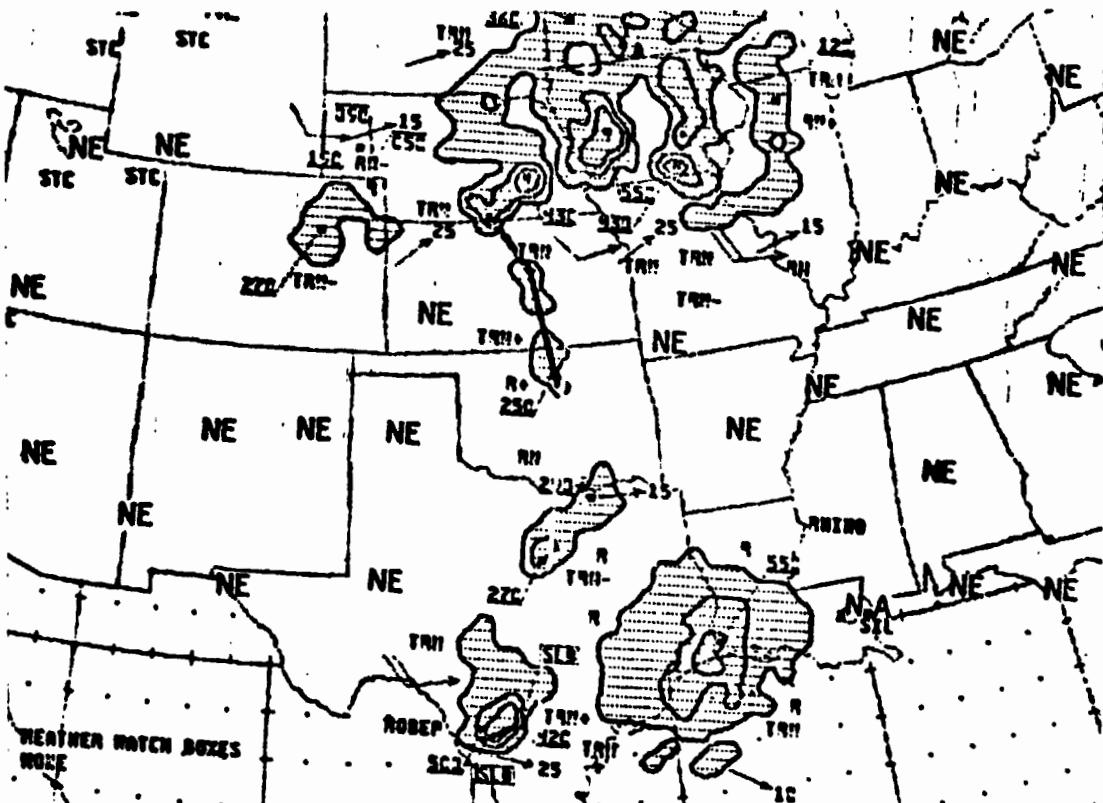


Fig. 18. Radar summary for 0635 GMT 20 April 1979.

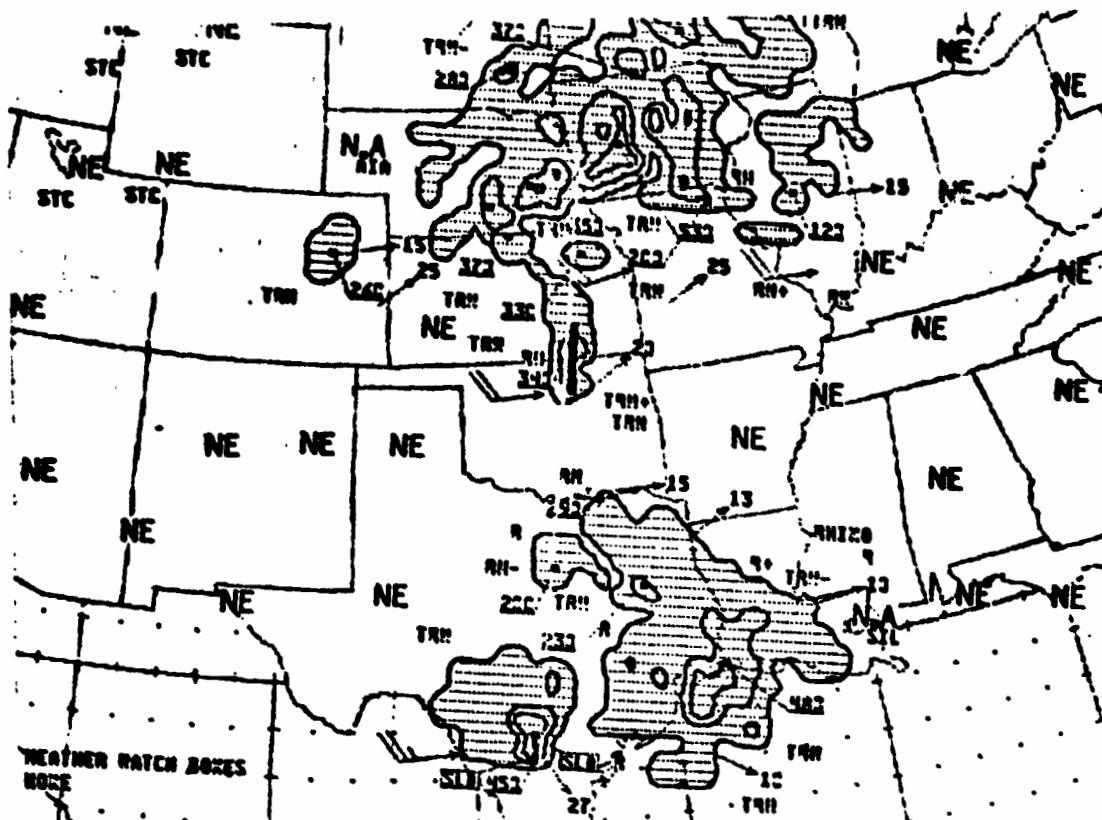


Fig. 19. Radar summary for 0735 GMT 20 April 1979.

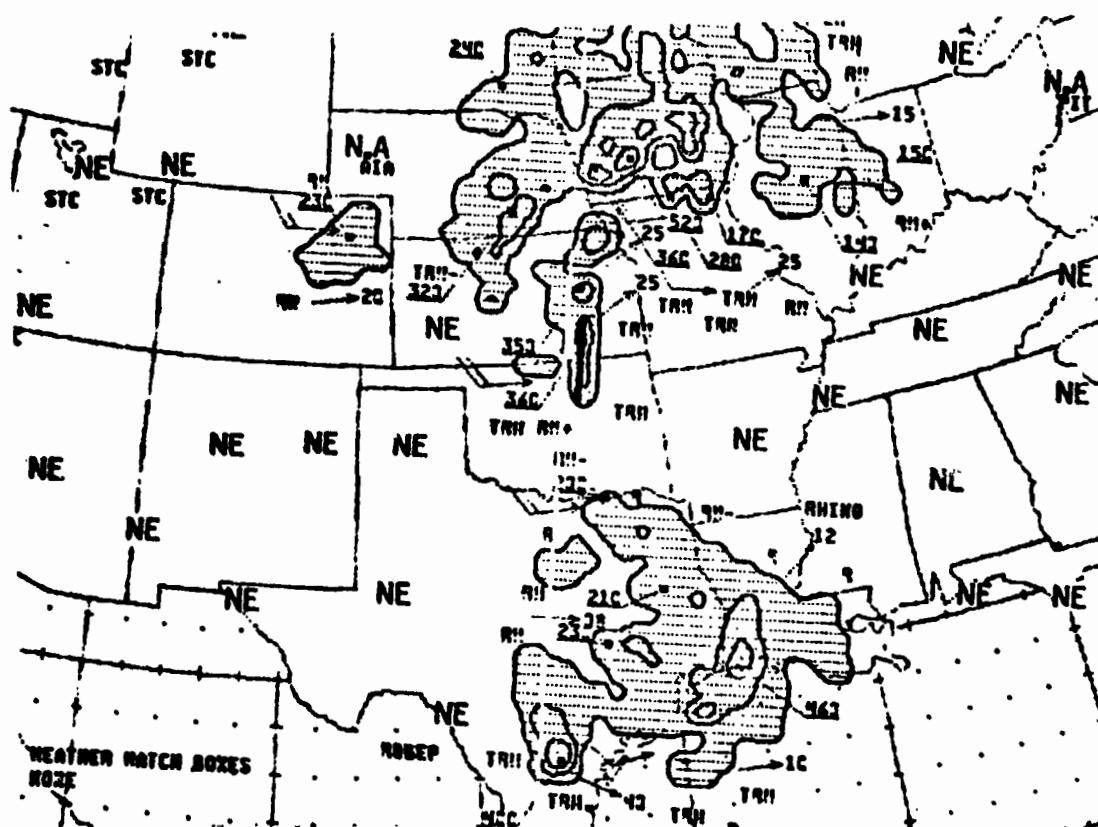


Fig. 20. Radar summary for 0835 GMT 20 April 1979.

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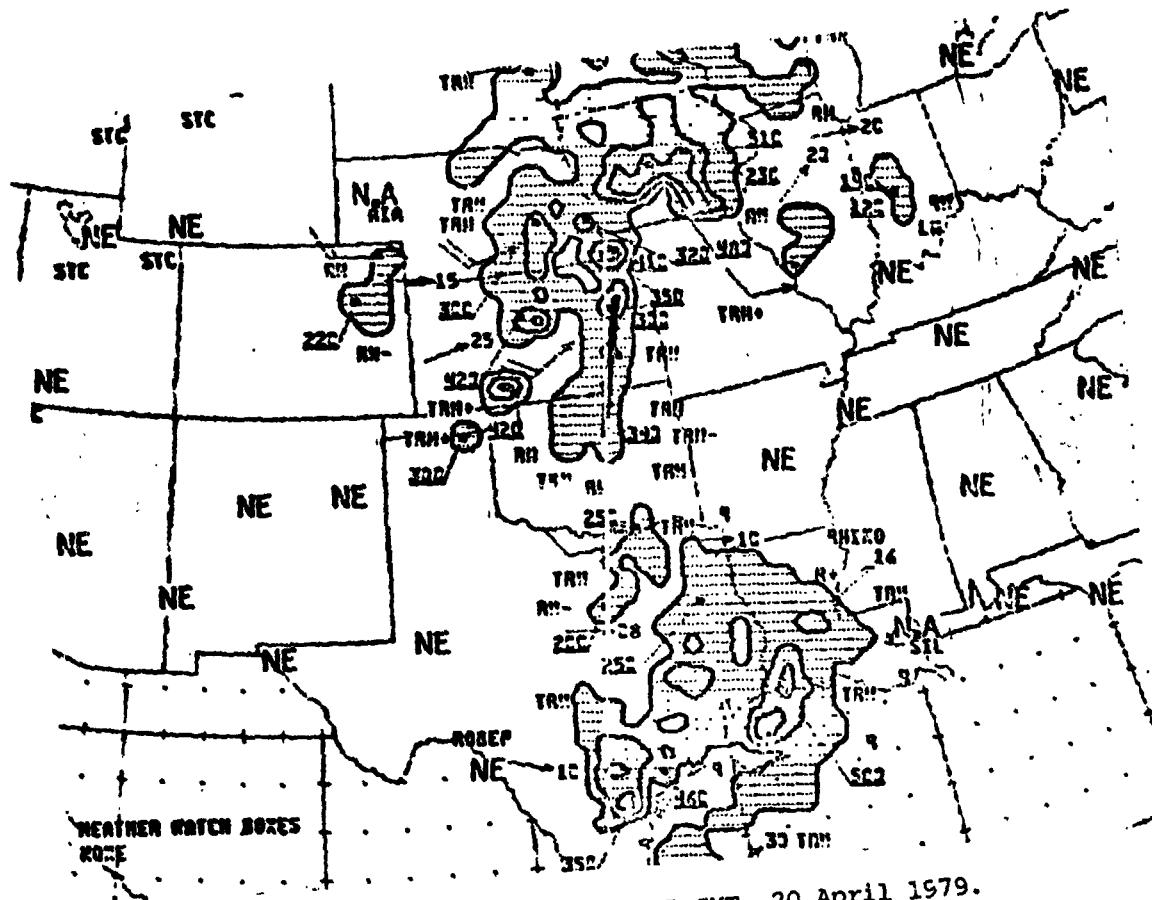


Fig. 21. Radar summary for 0935 GMT 20 April 1979.

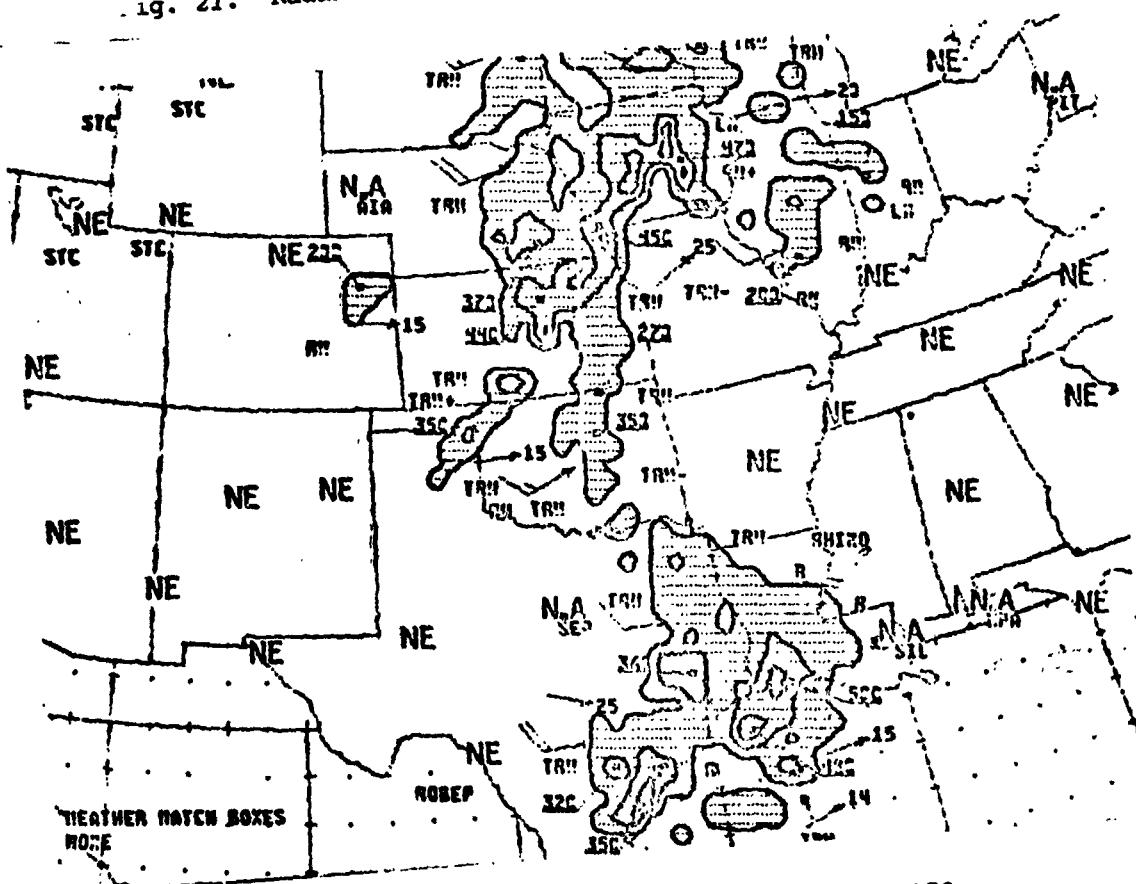
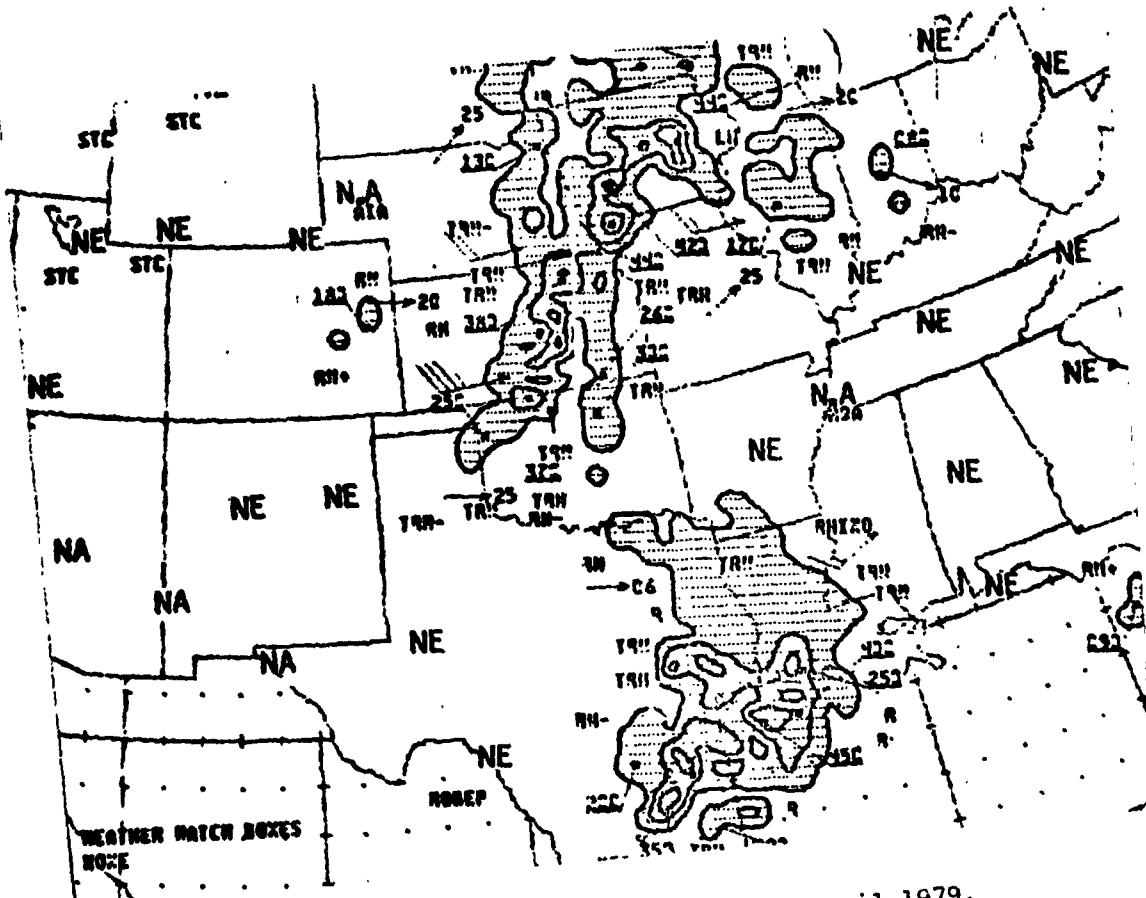


Fig. 22. Radar summary for 1035 GMT 20 April 1979.



1201 19AP79 11E-22A 01313 12921 KB35N95W

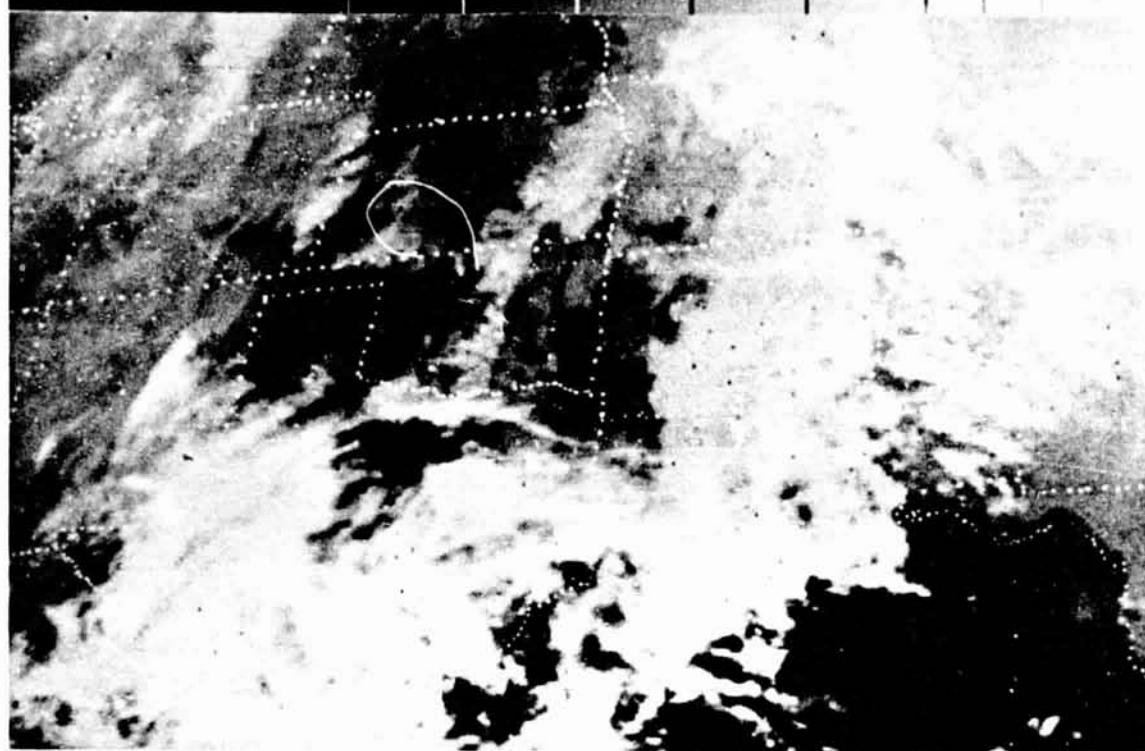


Fig. 24. GOES-East infrared satellite imagery for 1201 GMT
19 April 1979.

1301 19AP79 11A-2 01212 13051 KB35N95W

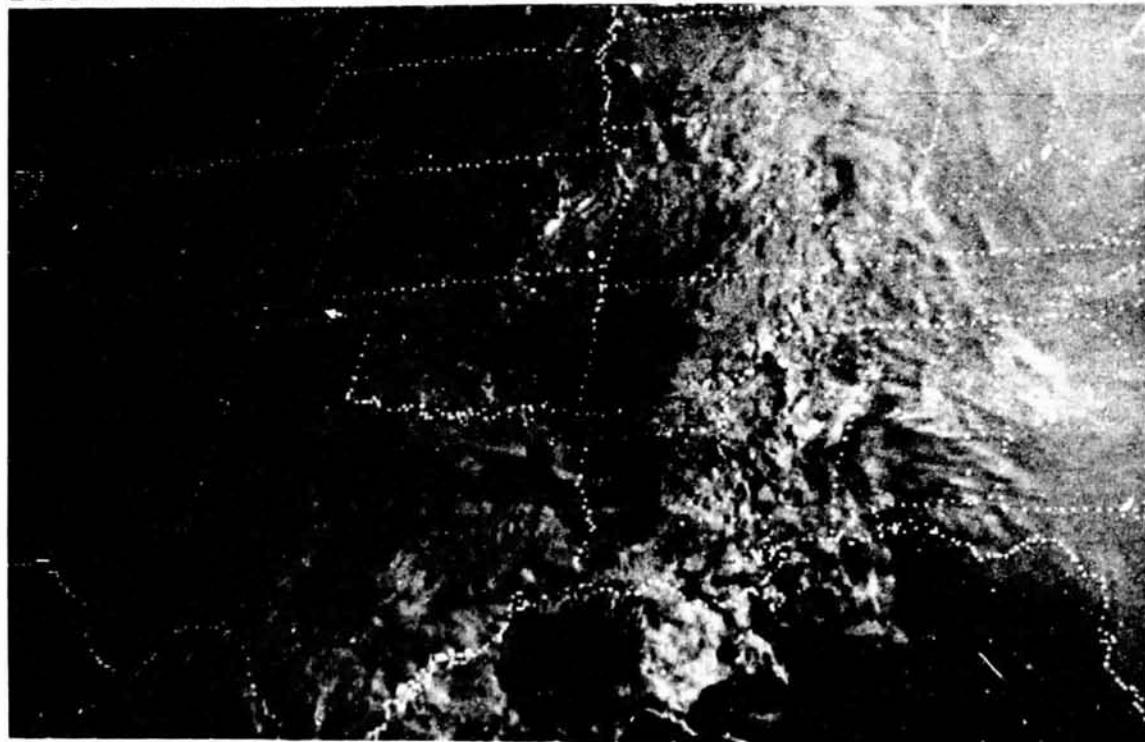


Fig. 25. GOES-East visual satellite imagery for 1301 GMT
19 April 1979.

1401 19AP79 11A-2 01133 13202 KB35N95W

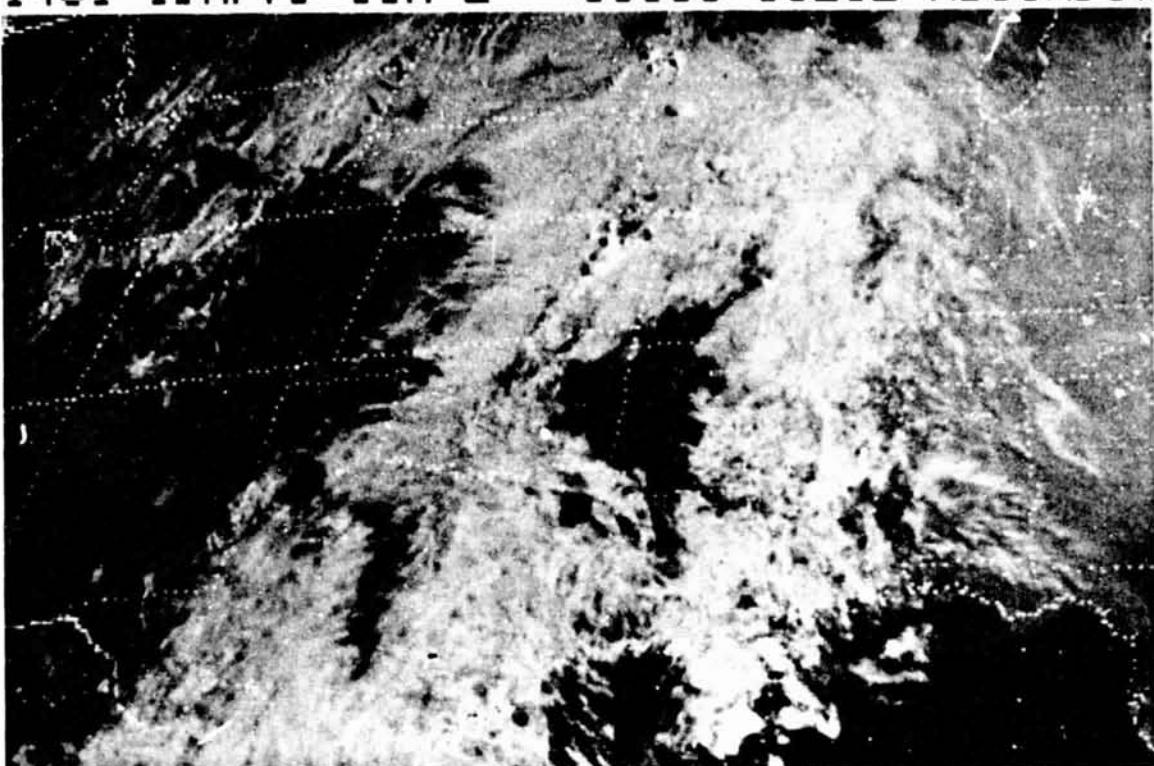


Fig. 26. GOES-East visual satellite imagery for 1401 GMT
19 April 1979.

1501 19AP79 11A-2 01062 13381 KB35N95W

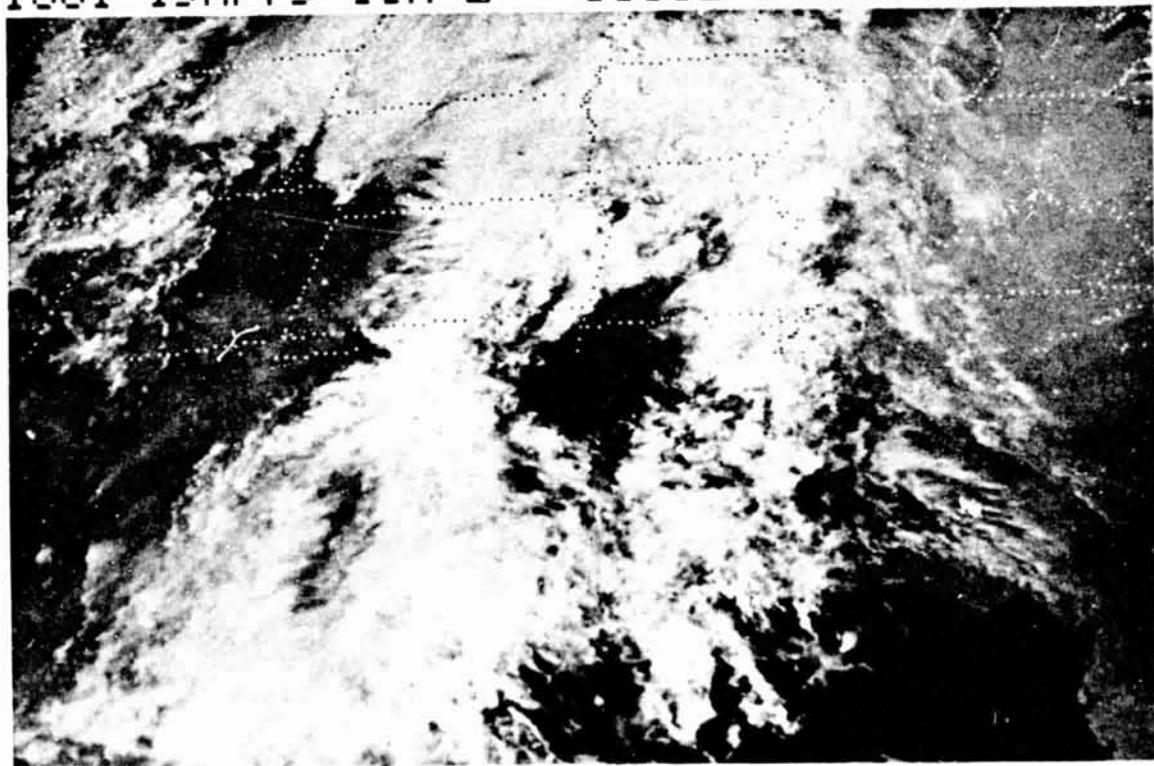


Fig. 27. GOES-East visual satellite imagery for 1501 GMT
19 April 1979.

1601 19AP79 11A-2 01014 13551 KB35N95W

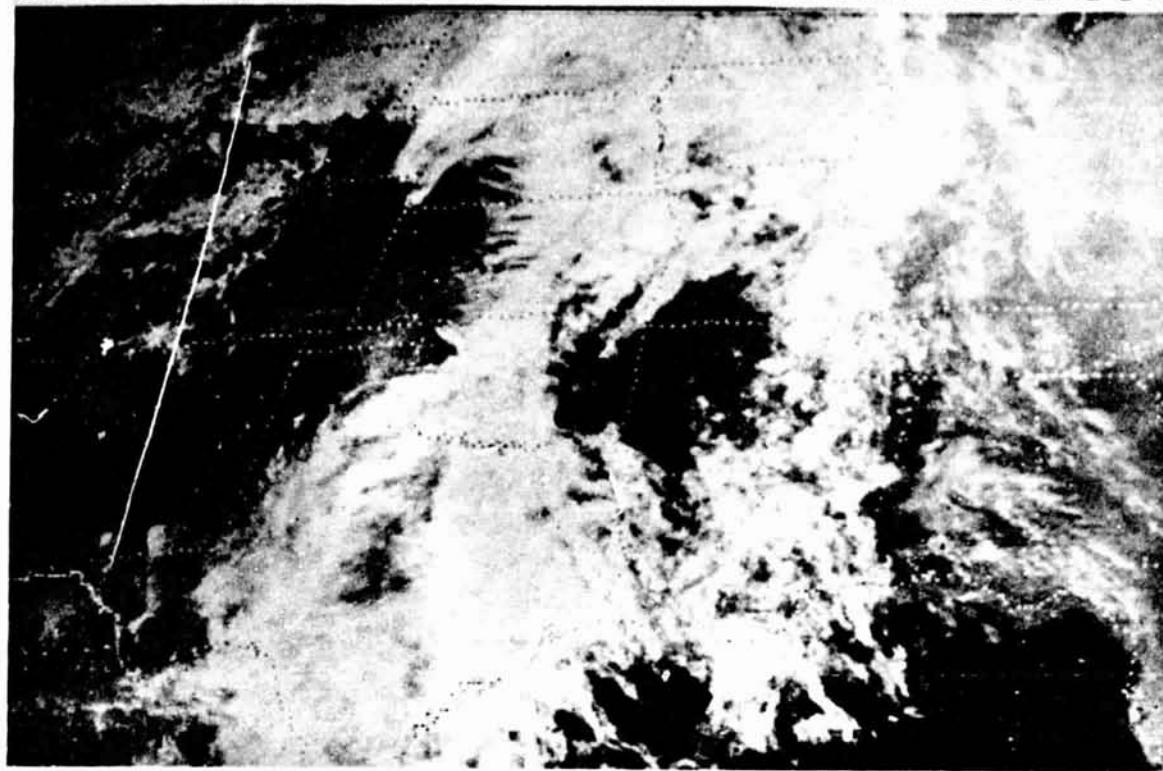


Fig. 28. GOES-East visual satellite imagery for 1601 GMT
19 April 1979.

1701 19AP79 11A-2 00981 13602 KB35N95W

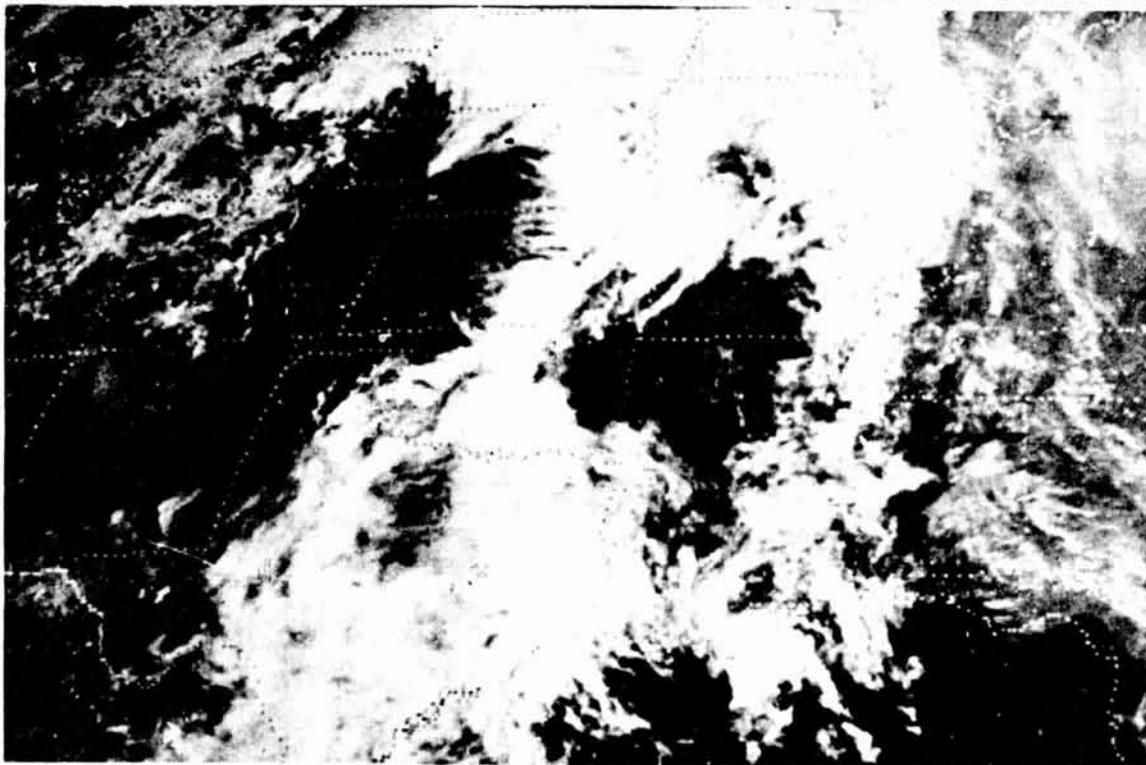


Fig. 29. GOES-East visual satellite imagery for 1701 GMT
19 April 1979.

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1801 19AP79 11A-2 00992 13771 KB35N95W

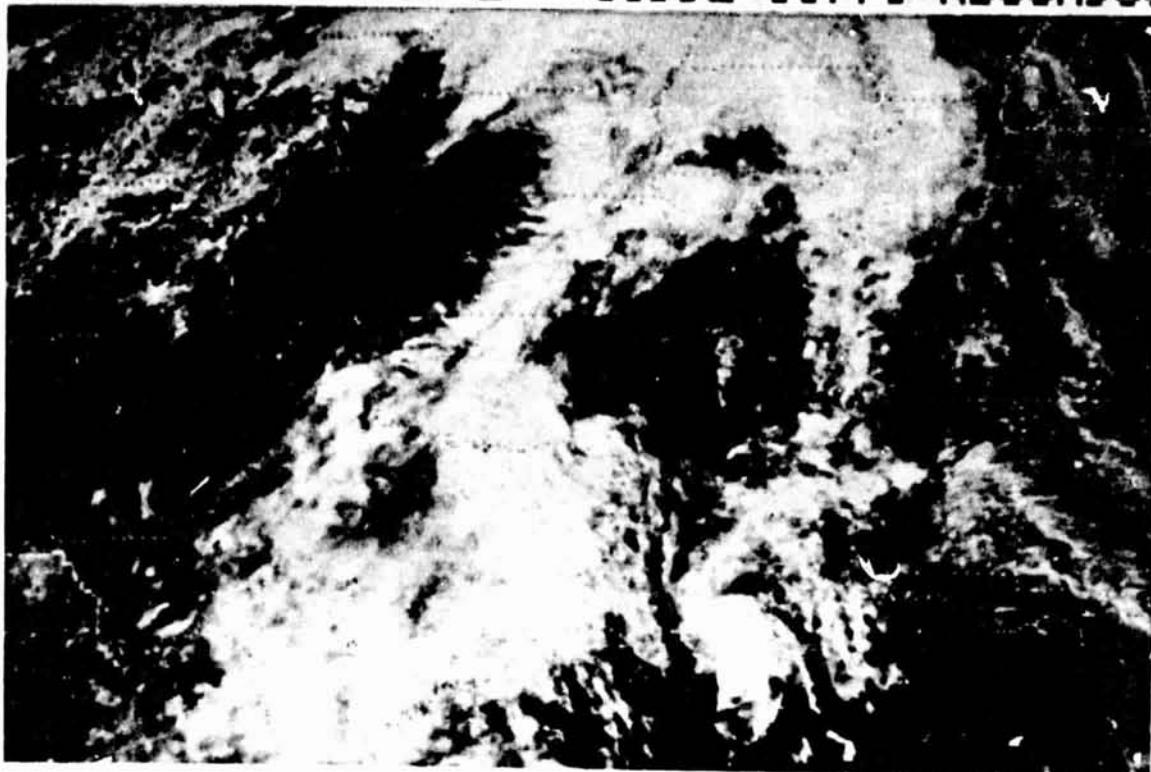


Fig. 30. GOES-East visual satellite imagery for 1801 GMT
19 April 1979.

2001 19AP79 12A-2 00411 13992 KB35N95W



Fig. 31. GOES-East visual satellite imagery for 2001 GMT
19 April 1979.

2101 19AP79 12A-2 01431 13472 KB35N95W



ORIGINAL PAGE IS Fig. 32. GOES-East visual satellite imagery for 2101 GMT
OF POOR QUALITY 19 April 1979.

2201 19AP79 12A-2 01423 13472 KB35N95W

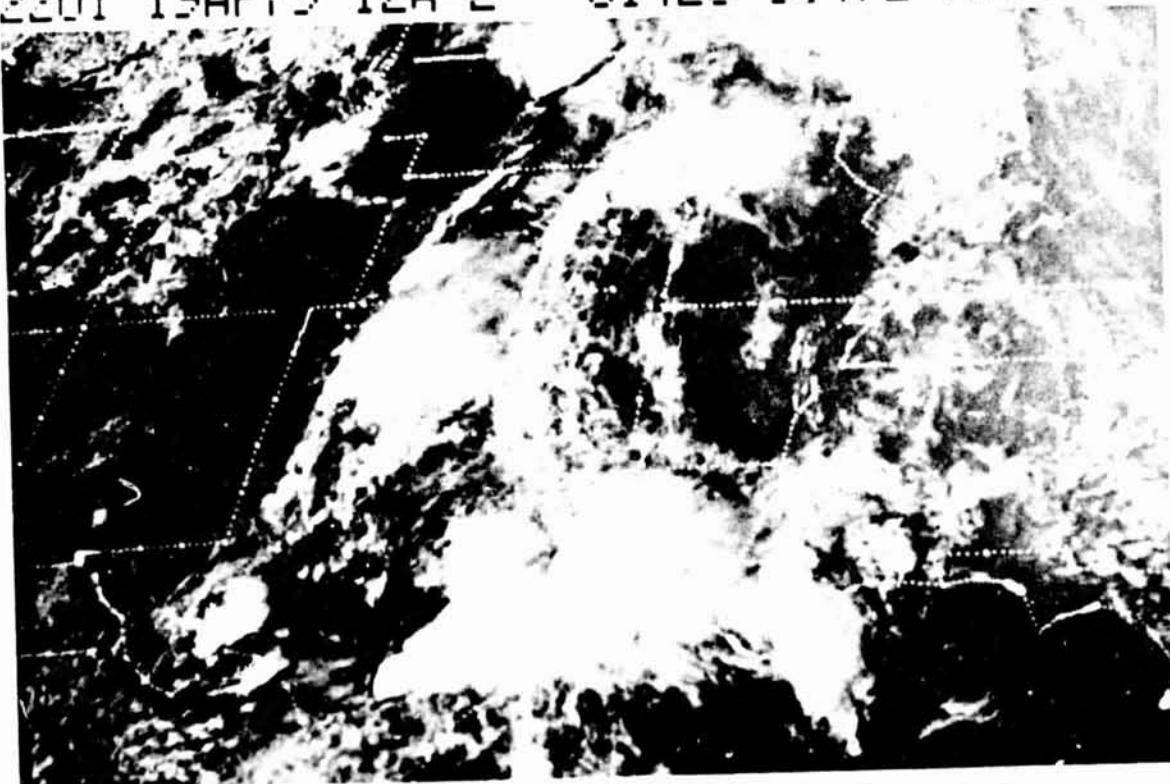


Fig. 33. GOES-East visual satellite imagery for 2201 GMT
19 April 1979.

2301 19AP79 12A-2 01421 13472 P035N95W

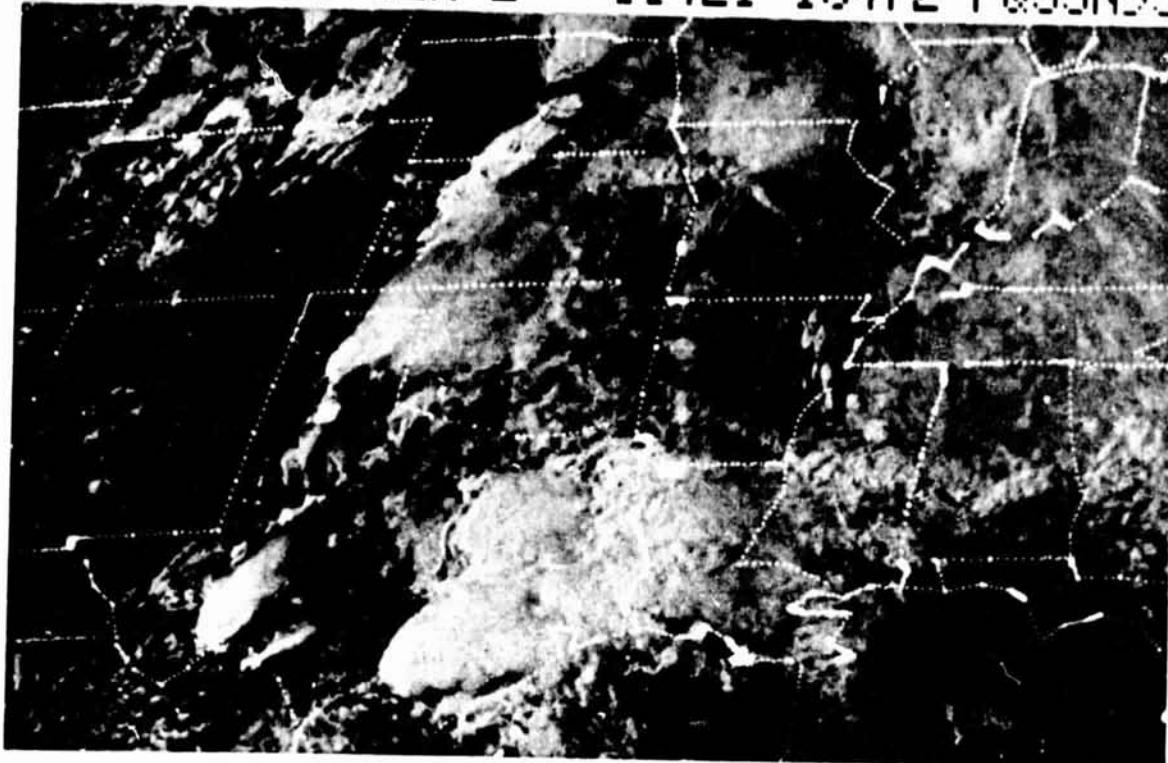


Fig. 34. GOES-East visual satellite imagery for 2301 GMT
19 April 1979.

0001 20AP79 12E-22A 01421 13472 P035N95W

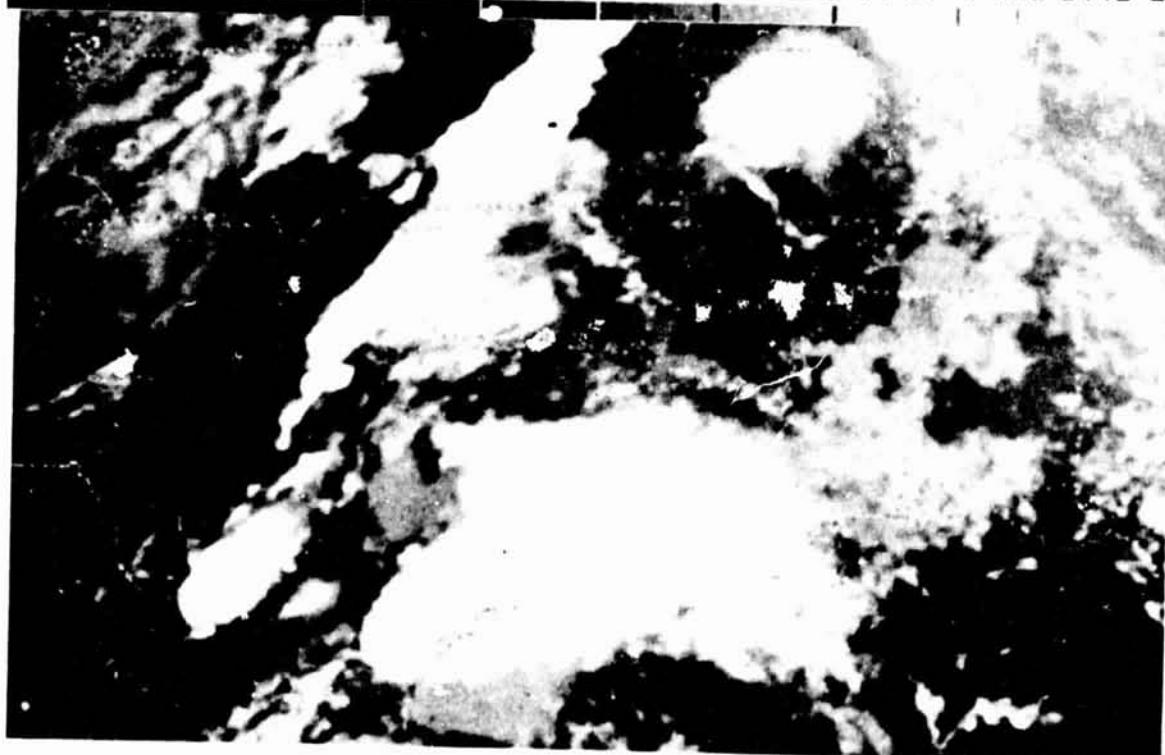


Fig. 35. GOES-East infrared satellite imagery for 0001 GMT
20 April 1979.

0101 20AP79 12E-22A 01414 13472 P035N95W

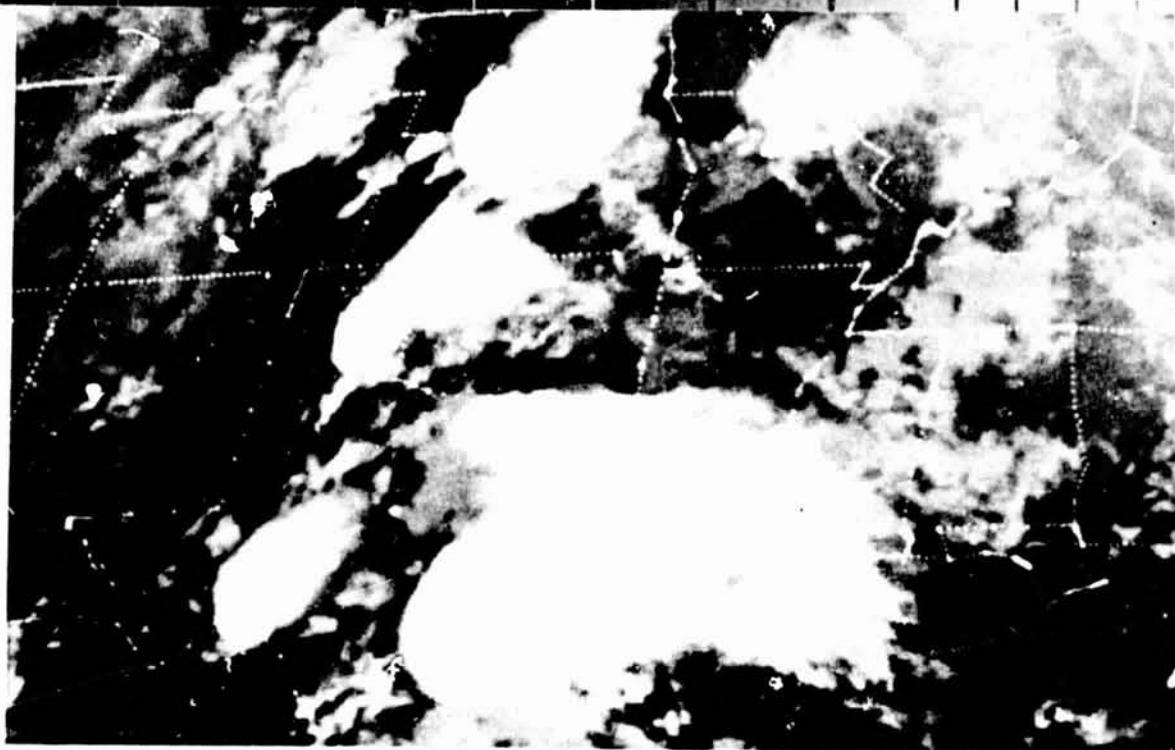


Fig. 36. GOES-East infrared satellite imagery for 0101 GMT
20 April 1979.

0145 20AP79 12E-22A 01413 13472 P035N95W

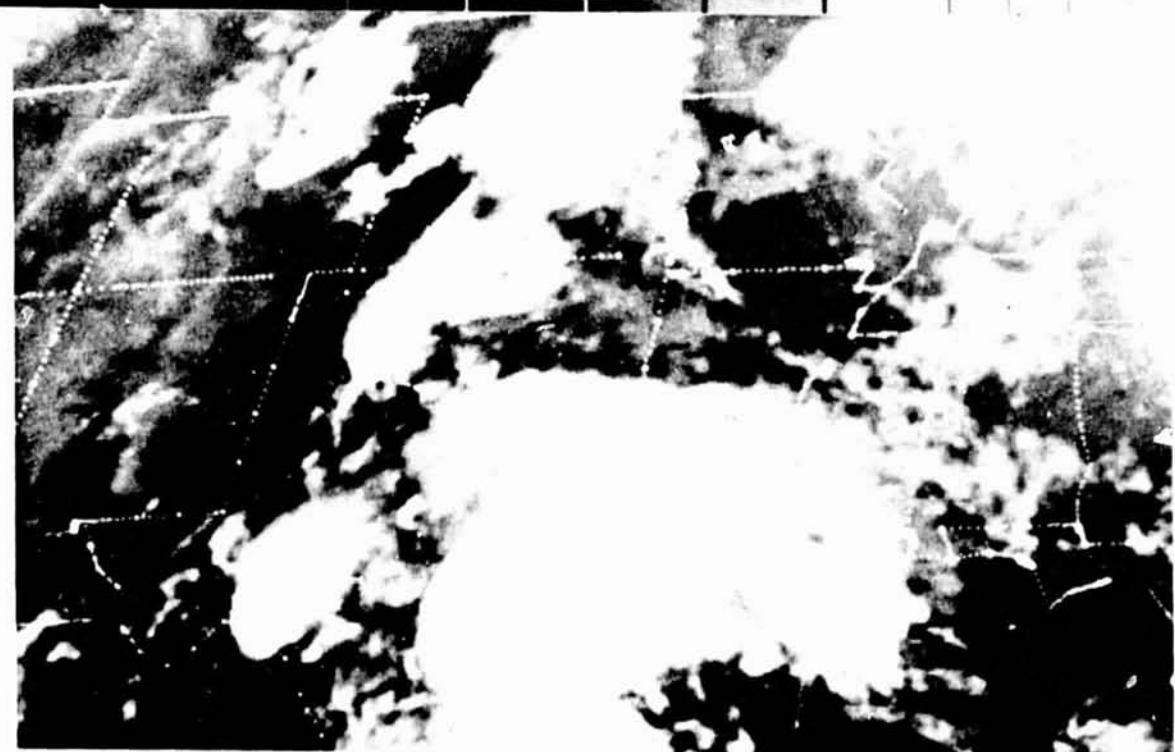


Fig. 37. GOES-East infrared satellite imagery for 0145 GMT
20 April 1979.

0315 20AP79 12E-2ZA 01413 13411 PQ35N95W

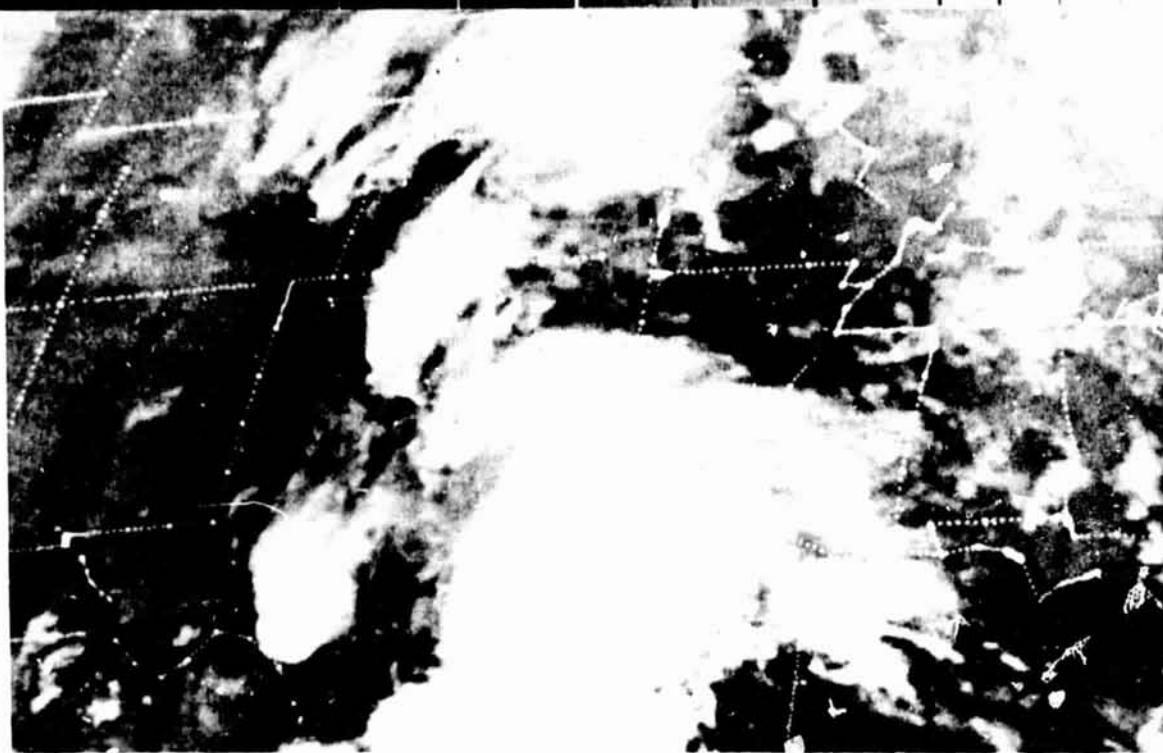


Fig. 38. GOES-East infrared satellite imagery for 0315 GMT
20 April 1979.

0401 20AP79 12E-2ZA 01431 12872 PQ35N95W

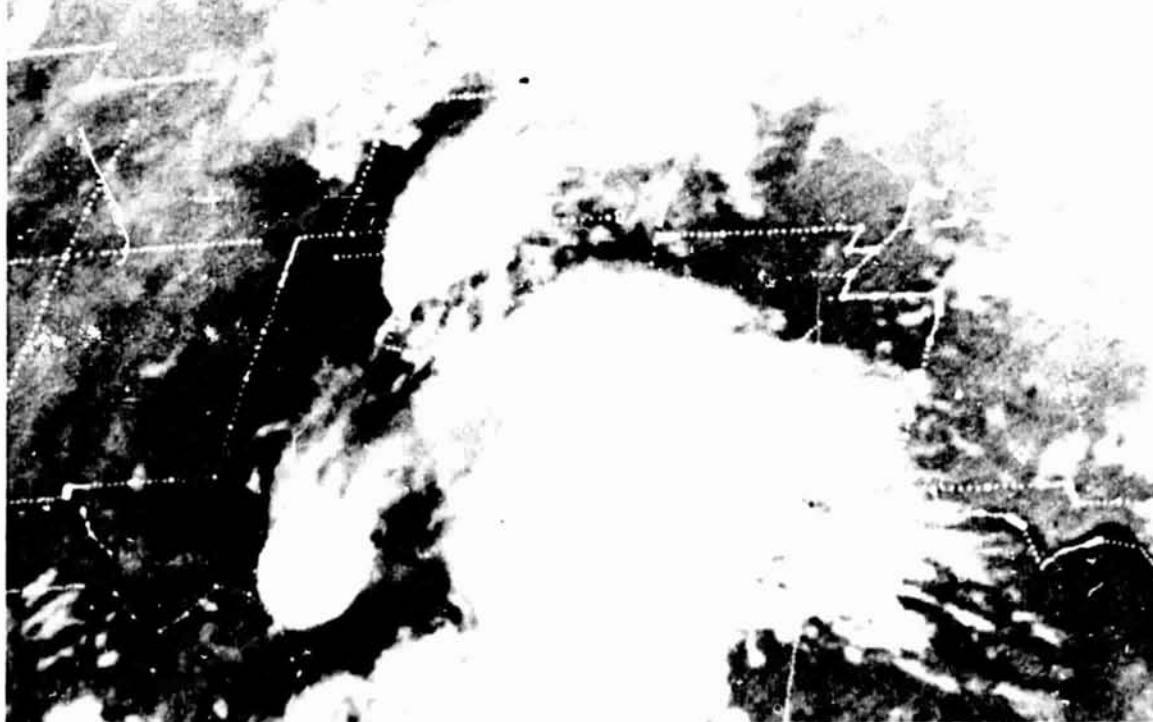


Fig. 39. GOES-East infrared satellite imagery for 0401 GMT
20 April 1979.

0501 20AP79 12E-2ZA 01424 12881 KB35N95W

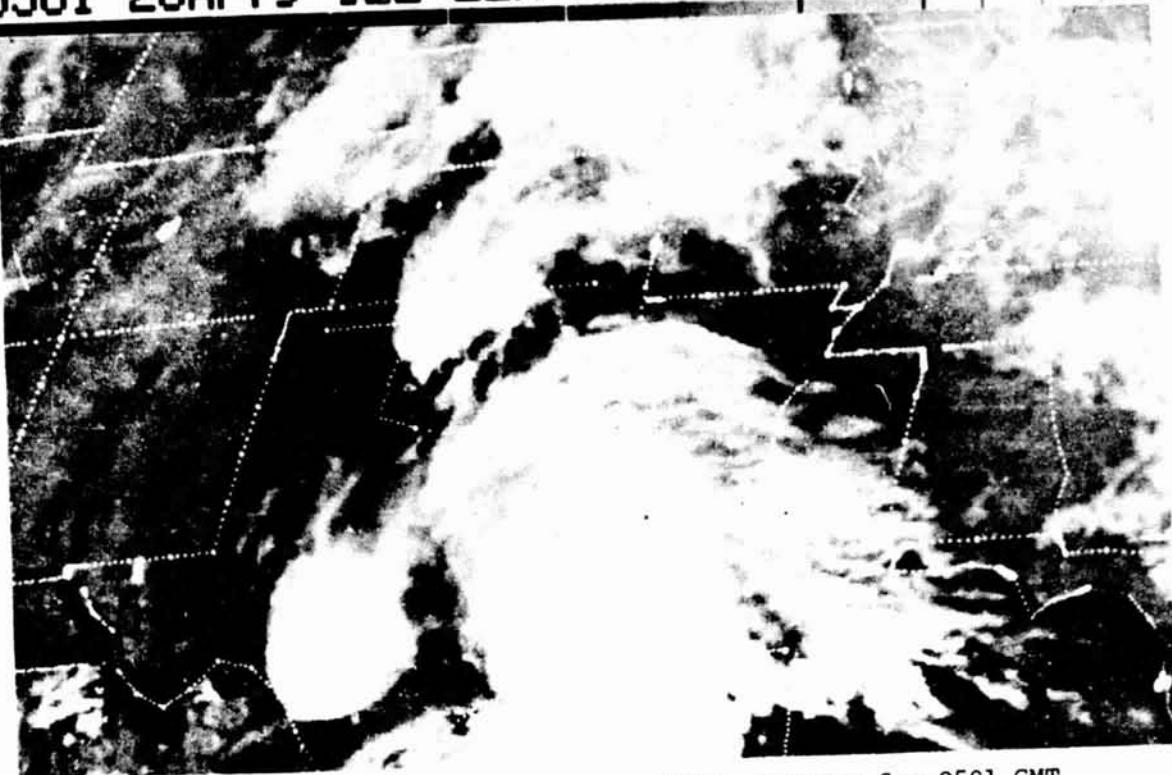


Fig. 40. GOES-East infrared satellite imagery for 0501 GMT
20 April 1979.

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0531 20AP79 12E-2ZA 01474 12882 KB35N95W



Fig. 41. GOES-East infrared satellite imagery for 0531 GMT
20 April 1979.

0701 20AP79 12E-2ZA 01431 12902 KB35N95W

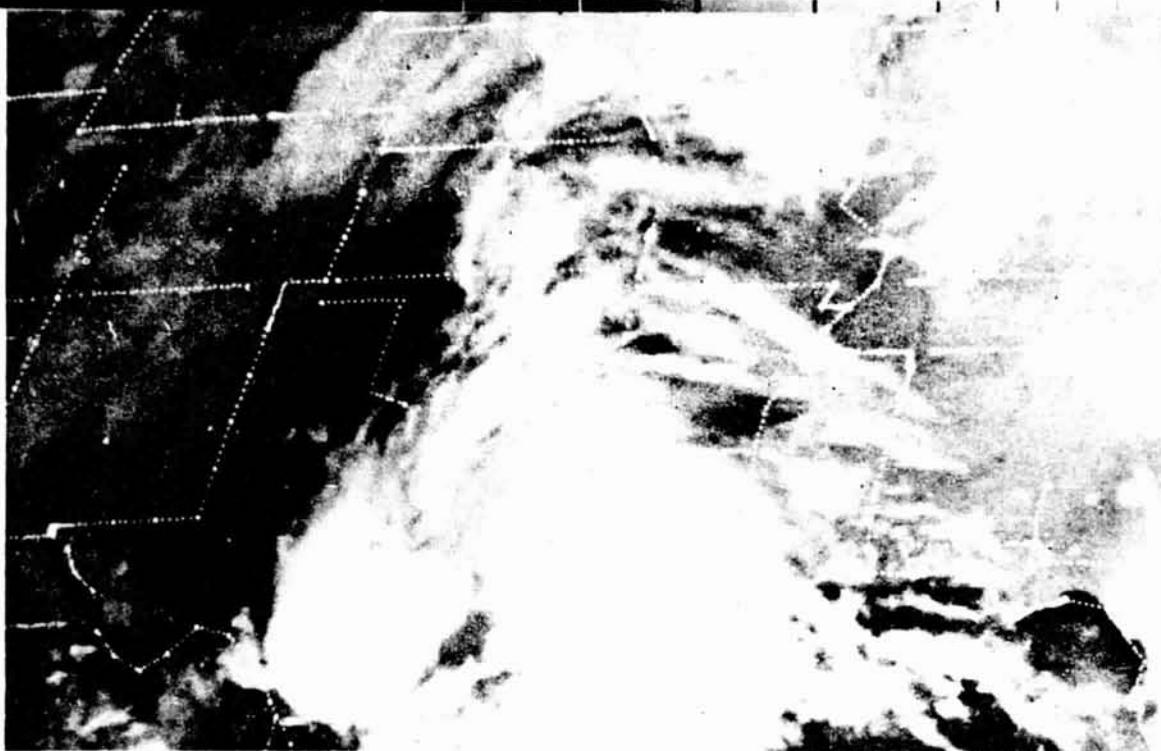


Fig. 42. GOES-East infrared satellite imagery for 0701 GMT
20 April 1979.

0801 20AP79 12E-2ZA 01431 12921 KB35N95W



Fig. 43. GOES-East infrared satellite imagery for 0801 GMT
20 April 1979.

0901 20AP79 12E-2ZA 01432 12941 KB35N95W



Fig. 44. GOES-East infrared satellite imagery for 0901 GMT
20 April 1979.

1031 20AP79 12E-2ZA 01432 12962 KB35N95W

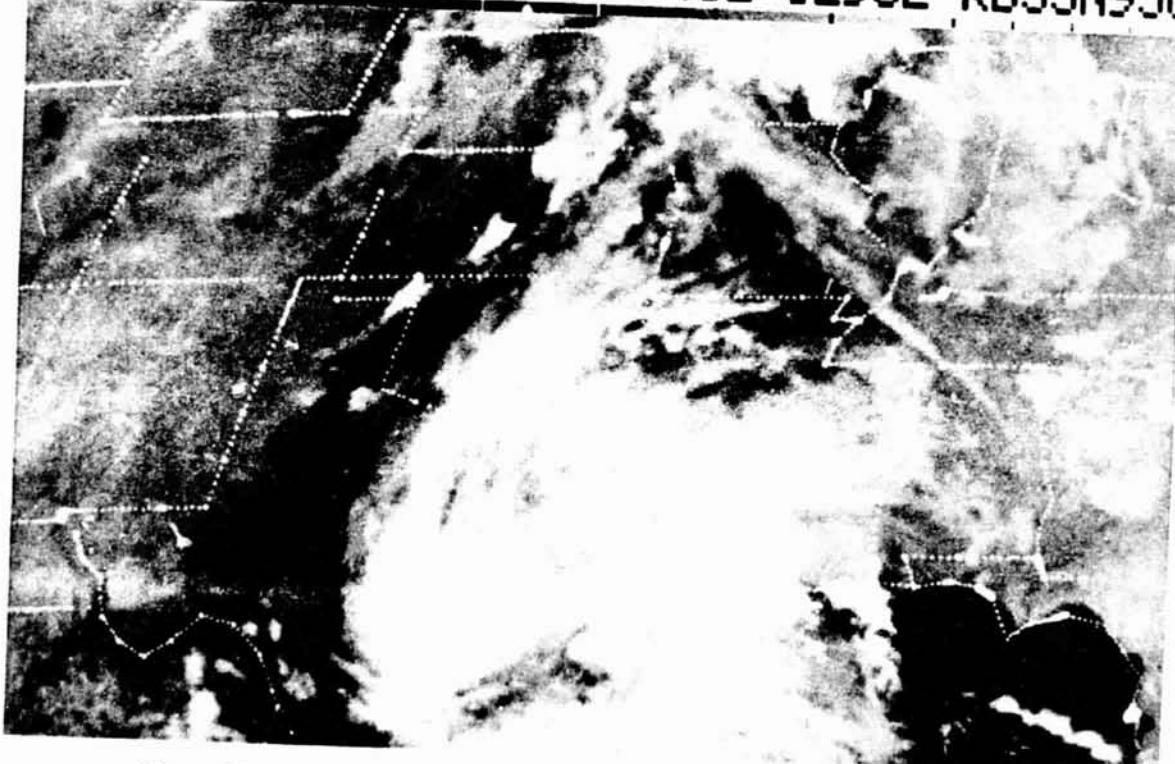


Fig. 45. GOES-East infrared satellite imagery for 1031 GMT
20 April 1979.

1101 20AP79 12E-22A 01433 12972 KB35N95W

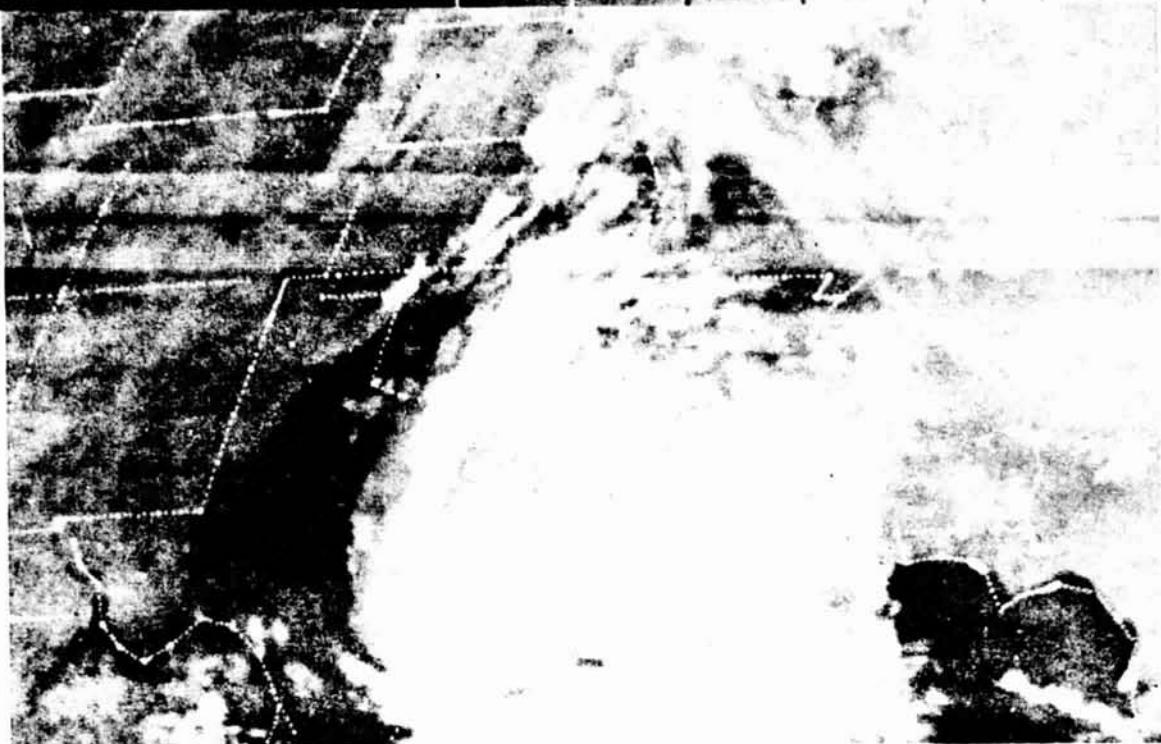


Fig. 46. GOES-East infrared satellite imagery for 1101 GMT
20 April 1979.

1101 20AP79 12E-22A 01433 12972 KB35N95W

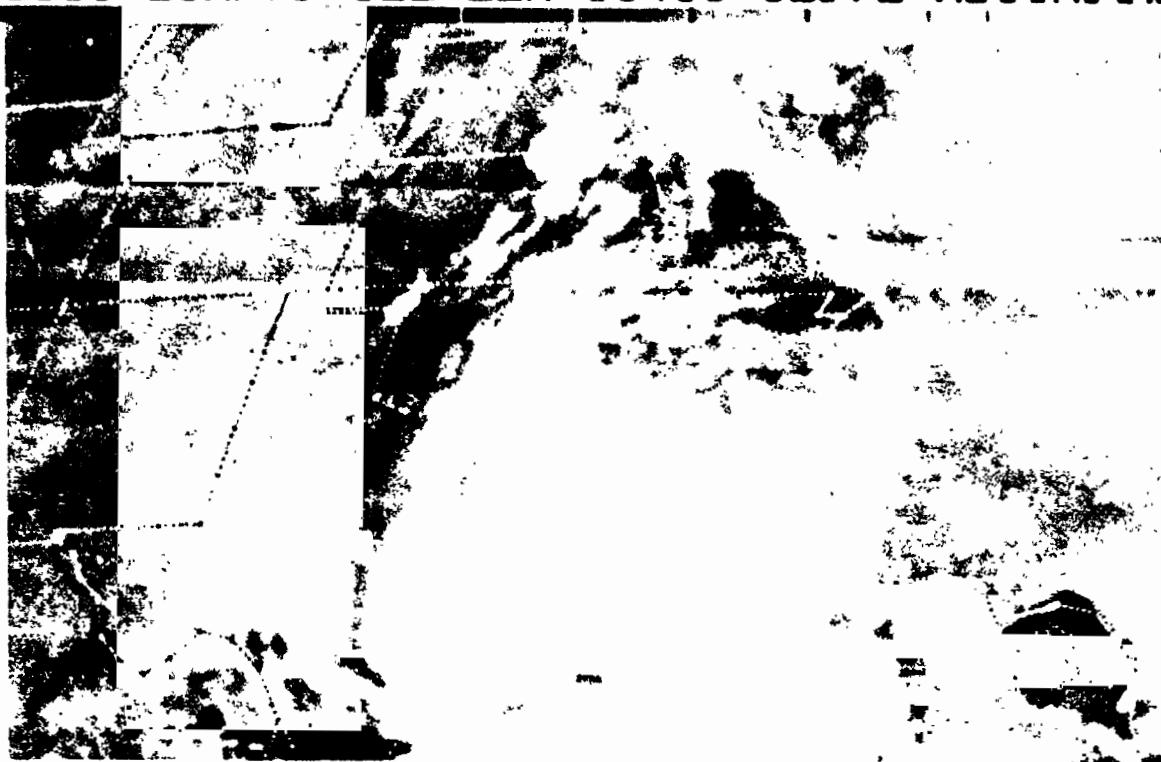


Fig. 46. GOES-East infrared satellite imagery for 1101 GMT
20 April 1979.

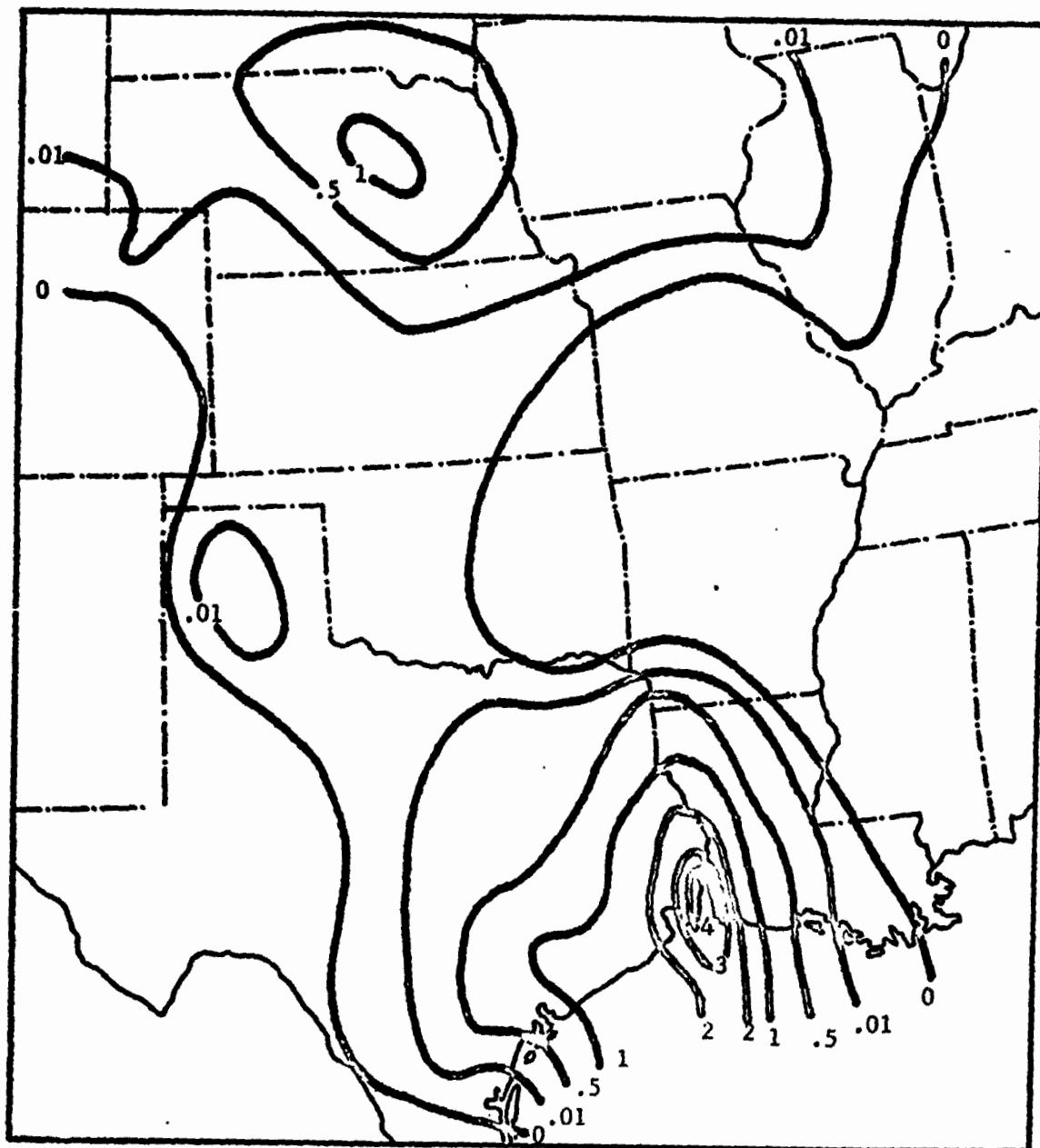


Fig. 47. Total rainfall amounts in inches for the period 1200 GMT
19 April 1979 to 1200 GMT 20 April 1979.

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Table 2. Teletype reports taken from NOAA weather wire and national weather summaries of severe and unusual weather from 1200 GMT 19 April to 1200 GMT 20 April 1979.

<u>EVENT</u>	<u>LOCATION</u>	<u>TIME (GMT)</u>
FLASH FLOOD WATCH	SAN ANTONIO, DEL RIO AND TEXAS HAVE A FLASH FLOOD WATCH IN EFFECT FOR TODAY.	1210
RAREP SAT	SCATTERED TRWS FROM SAN ANTONIO TO N OF DEL RIO AND S OF CORPUS CHRISTI AND LAREDO IN TEXAS. MOVEMENT TO NE AT 15 MPH WITH RAINFALL RATES UP TO 1 INCH PER HOUR. MAX TOPS TO 28,000 FT.	1235
RAIN	1 INCH OF RAIN AT KELLY AFB IN THE PAST 6 HRS.	1300
RAREP LCH	ISOLDED RWS AND -R FROM E OF ALEXANDRIA TO BATON ROUGE IN LOUISIANA, MOVING E.	1335
RAREP SAT	VERY HEAVY TRWS LOCATED IN EDWARDS CO. WITH OTHER RWS WIDELY SCATTERED FROM S OF SAN ANGELO TO DEL RIO AND SE INTO THE COTULLA-BEEVILLE AREAS IN TEXAS. MOVEMENT TO NE AT 15 MPH WITH RAINFALL.	1340
RAREP SEP	SCATTERED RWS FROM NEAR SAN ANGELO TO 25 MI. N OF SWEETWATER IN TEXAS, MOVING NE AT 10 MPH.	1350
RIME ICE	RIME ICE ON AIRCRAFT AT 17,000 FT ABOVE ST. LOUIS, MISSOURI	1356
FLASH FLOOD WATCH	CONTINUED WATCH ALONG AND W OF A LINE FROM LAREDO TO VICTORIA TO COLLEGE STATION.	1415
RAREP SAT	SCATTERED RW AND -R 35 MI SE OF OZONA, TEXAS, MOVING NE AT 15 MPH. RAINFALL RATE IS LESS THAN $\frac{1}{2}$ INCH PER HR. MAX TOPS TO 23,000 FT NEAR ROCK SPRINGS, TEXAS.	1435
RAREP SEP	-RWS WIDELY SCATTERED OVER AN AREA 30 MI WIDE FROM JUST N OF SWEETWATER TO NEAR SAN ANGELO MOVING NE AT 10 MPH. PRECIPITATION TOPS UNIFORMLY AT 18,000 FT.	1450
RAREP LCH	WIDELY SCATTERED -RWS WERE LOCATED BETWEEN NATCHEZ, MISSISSIPPI AND ALEXANDRIA, LOUISIANA S TO THE LOUISIANA BORDER.	1535
RAREP SEP	-RW SE OF SAN ANGELO MOVING NE AT 10 MPH.	1550

TABLE 2. CONTINUED.

<u>EVENT</u>	<u>LOCATION</u>	<u>TIME (GMT)</u>
RIME ICE	RIME ICE ON AIRCRAFT OVER SAN ANTONIO, TEXAS	1554
FLASH FLOOD WATCH	FLASH FLOOD WATCH ISSUED EARLIER IS CANCELLED	1630
RAREP SAT	TRW DEVELOPED 30 MI E OF DEL RIO, TEXAS MOVING NE AT 15 MPH.	1635
FLOOD WARNING	WARNING ISSUED FOR SAN JACINTO RIVER AND LAKE HOUSTON AREA.	1642
RAREP GLS	VERY HEAVY TRWS NEAR BELLEVILLE AND LAKE HOUSTON MOVING ENE AT 25 MPH.	1650
RAREP SEP	FEW HEAVY TRWS LOCATED NEAR LLANO TO FREDERICKSBURG AND JUNCTION IN TEXAS. MOVEMENT TO NE AT 15 MPH. TOPS NEAR JUNCTION TO 32,000 FT.	1650
SVR TRW WARNING	WARNING ISSUED FOR JEFFERSON, CO TEXAS UNTIL 12:30 PM CST.	1706
ROTOR CLOUDS	ROTOR CLOUDS BUILDING OVER DENVER COLORADO	1710
HAIL	HAILSTONES FELL ON HILL CITY, KANSAS	1710
FLASH FLOOD WATCH	WATCH ISSUED THIS AFTERNOON AND TONIGHT ALONG AND E OF A LINE FROM COLLEGE STATION TO PALACIOS.	1730
RAIN	11½ INCHES OF RAIN FELL IN THE CONROE, TEXAS AREA OVER THE PAST 24 HRS.	1730
RAREP LCH	ISOLATED -RWS OVER CENTRAL LOUISIANA. SCATTERED TRWS INCREASING OVER SE TEXAS AND SW LOUISIANA.	1735
RAREP SAT	-R OVER LARGE AREA: FROM DEL RIO TO SE OF SAN ANGELO, IN THE NW ACROSS S CENTRAL TEXAS TO THE COTULLA-VICTORIA-LAGRANGE AREAS IN THE SE. MOVEMENT IS TO THE NE AT 15 MPH. MAX TOP OF 23,000 FT 5 MI N OF VICTORIA.	1735
SVR TRW WARNING	WARNING ISSUED FOR BORDEN CO, EFFECTIVE UNTIL 1:00 PM CST.	1750
RAREP GLS	VERY HEAVY TRW LOCATED IN EXTREME SE BREZORIA CO, TEXAS MOVING NE AT 25 MPH.	1750
RAREP MAF	SVR TRW LOCATED 8 MI SE OF GAIL, TEXAS MOVING N AT 18 MPH.	1800
TURBULENCE	SVR TURBULENCE ENCOUNTERED BY AIRCRAFT OVER TEXARKANA, ARKANSAS.	1807

TABLE 2. CONTINUED.

<u>EVENT</u>	<u>LOCATION</u>	<u>TIME (GMT)</u>
RAREP GGG	SCATTERED VERY HEAVY TRWS IN AN AREA 20 MI NW OF LUFKIN TO LAKE LIVINGSTON TO N OF BEAUMONT IN TEXAS. HEAVIEST STORMS WERE 10 MI SE OF CROCKETT AND 30 MI SW OF JASPER. MOVEMENT TO N AT 15 MPH.	1830
TURBULENCE	SVR TURBULENCE ENCOUNTERED BY AIRCRAFT OVER GILL, CO AND DOUGLAS, WY.	1830
RAREP SAT	HEAVY TRWS S AND 25 MI NW OF NEW BRAUNFELS, 25 MI SW AND 30 MI NW OF AUSTIN AND 5 AND 25 MI S OF SAN ANTONIO. RAINFALL RATES ARE UP TO 1 INCH AN HR. MAX TOPS TO 32,000 FT NEAR NEW BRAUNFELS. MOVEMENT TO NE AT 15 MPH.	1835
RAREP LCH	VERY HEAVY TRWS JUST NW OF DEQUINCY, LOUISIANA MOVING N. SCATTERED RWS AND TRWS OVER S HALF OF LOUISIANA.	1840
RAREP LCH	HEAVY TRWS LOCATED FROM NEAR COLLEGE STATION TO AUSTIN TO LAMPASAS, IN TEXAS, MOVING NE AT 15 MPH.	1850
RAIN	RAINFALL RATES OF 1 TO 2 INCHES PER HR WERE LOCATED NEAR BASTROP, CALDWELL AND COLLEGE STATION, IN TEXAS.	1900
SVR TRW WARNING	WARNING EFFECTIVE UNTIL 2:00 PM CST FOR HARDIN CO TEXAS.	1900
FUNNEL CLOUD	CLOUD SPOTTED 3 MI N OF KNAPP, TEXAS MOVING N AT 20 MPH.	1912
TORNADO WARNING	WARNING EFFECTIVE UNTIL 2:30 PM CST FOR SCURRY CO TEXAS.	1915
RAREP SAT	VERY HEAVY TRWS GROWING. MAX TOP OF 38,000 FT NEAR NEW BRAUNFELS.	1935
RAREP SEP	VERY HEAVY TRWS NEAR AUSTIN, TEXAS WITH TOPS TO 37,000 FT.	1950
FLOOD WARNING	WARNING FOR NUECES RIVER, HONDO CREEK, AND SECO CREEK, IN TEXAS	2000
RAREP LBB	RWS LOCATED JUST S OF GARZA CO TO MOTLEY CO. VERY HEAVY TRWS LOCATED OVER THE PANHANDLE AREA. ALL ACTIVITY MOVING NE AT 25 MPH	2022

TABLE 2. CONTINUED.

<u>EVENT</u>	<u>LOCATION</u>	<u>TIME (GMT)</u>
SVR TRW WARNING	WARNING ISSUED FOR W VERNON PARISH, LOUISIANA EFFECTIVE UNTIL 3:30 PM CST.	2025
FUNNEL CLOUD	CLOUD SPOTTED 15 MI SE OF SAN ANTONIO, MOVING NE AT 20 MPH IN TEXAS.	2030
FLASH FLOOD WARNING	WARNING EFFECTIVE UNTIL 6:30 PM CST FOR POTTER, RANDALL, CANSO, ARMSTRONG AND BRISCOE CO OF TEXAS.	2035
RAREP SAT	VERY HEAVY TRW 25 MI SE OF SAN ANTONIO WITH A RAINFALL RATE OF OVER 2 INCHES PER HR. MAX TOP AT 41,000 FT.	2035
TORNADO	POSSIBLE TORNADO ECHO ABOUT 20 MI SE OF SAN ANTONIO, MOVING NE AT 20 MPH IN TEXAS.	2040
TORNADO WATCH	WATCH NUMBER 90 ISSUED FOR CENTRAL AND SW KANSAS, NW OKLAHOMA AND NE PORTION OF TEXAS PANHANDLE, EFFECTIVE FROM 3:30 PM TO 9:30 PM CST.	2040
TORNADO WARNING	WARNING EFFECTIVE UNTIL 3:45 PM CST FOR GUADALUPE, GONZALES AND WILSON CO OF TEXAS.	2045
SVR TRW WARNING	WARNING ISSUED FOR JACKSON AND LAVACA CO OF TEXAS. EFFECTIVE UNTIL 4:00 PM CST.	2045
FLOOD WARNING	WARNING FOR PINE ISLAND BAYOU AND VILLAGE CREEK, TEXAS.	2047
RAIN	PINE ISLAND BAYOU HAD 2.5 INCHES OF RAIN IN ONE HR.	2047
TORNADO WARNING	WARNING ISSUED FOR JEFFERSON CO, TEXAS EFFECTIVE UNTIL 4:15 PM CST.	2115
FUNNEL CLOUD	CLOUD REPORTED 5 MI SW OF BEAUMONT MUNICIPAL AIRPORT, MOVING E IN TEXAS.	2115
TORNADOES	AIRCRAFT SIGHTED 2 SMALL TORNADOES NEAR BEAUMONT, TEXAS, MOVING E.	2115
RAREP SAT	SCATTERED VERY HEAVY TRWS WITH RAINFALL RATES IN EXCESS OF 2 INCHES PER HOUR AND POSSIBLE HAIL WERE OBSERVED JUST N OF JOURDANTON, 30 MI S AND SE OF SEGUIN IN TEXAS. MAX TOP AT JOURDANTON WAS AT 46,000 FT. MOVEMENT TO THE N AT 15 MPH.	2140

TABLE 2. CONTINUED.

<u>EVENT</u>	<u>LOCATION</u>	<u>TIME (GMT)</u>
SVR TRW WARNING	WARNING ISSUED FOR BEXAR, GUADALUPE, GONZALES AND WILSON CO IN TEXAS, EFFECTIVE UNTIL 5:00 PM CST.	2140
RAREP AUS	TRW ACTIVITY IN THE AUSTIN AREA DECREASING. RAINFALL RATES OF 1 INCH OR MORE PER HR OBSERVED IN TRW LINE 15 MI E OF AUSTIN. LINE MOVING NE AT 20 MPH.	2140
TURBULENCE	EXTREME TURBULENCE ENCOUNTERED BY AIRCRAFT OVER AMARILLO, TX.	2142
RAREP SEP	VERY HEAVY TRWS WERE OBSERVED NEAR WAXAHACHIE TO BRYAN, AUSTIN AND KILLEEN. HEAVIEST ACTIVITY WAS NEAR WACO AND TEMPLE. MAX TOP OF 50,000 FT LOCATED NEAR TEMPLE.	2150
FLASH FLOOD WATCH	WATCH HAS BEEN EXPANDED TO INCLUDE PART OF S CENTRAL TEXAS: AREA IS S AND E OF A LINE EXTENDING FROM LUFKIN TO AUSTIN TO SAN ANTONIO TO PALACIOS. WATCH IS IN EFFECT UNTIL 12:00 AM CST.	2200
FLASH FLOOD WATCH	WATCH ISSUED FOR THE AREA E OF A LINE FROM LUFKIN TO JACKSONVILLE TO 30 MI N OF LONGVIEW, TX.	2210
SVR TRW WARNING	WARNING ISSUED FOR ATOSCOSA CO, TEXAS, EFFECTIVE UNTIL 5:00 PM CST. WARNING ALSO ISSUED FOR WILSON AND KARNES CO OF TEXAS, EFFECTIVE UNTIL 5:30 PM CST.	2220
HAIL	REPORT OF LARGE HAIL IN VERY HEAVY TRW IN N ATOSCOSA CO, TX.	2220
RAREP SAT	A FEW VERY HEAVY TRWS WERE LOCATED FROM JUST E OF PLEASANTON, NEAR FALLS CITY, 15 MI E OF FLORESVILLE AND 25 MI S OF GONZALES. RAINFALL RATES IN THESE TRWS WAS IN EXCESS OF 2 INCHES PER HR. MOVEMENT TO NE AT 15 MPH. MAX TOP OF 44,000 FT OBSERVED 15 MI E OF FLORESVILLE.	2235
HAIL	HAIL AND GUSTY WINDS OBSERVED NEAR EL CAMPO, TEXAS.	2245
FLASH FLOOD WARNING	WARNING ISSUED FOR WILSON AND GONZALES CO OF TEXAS, EFFECTIVE UNTIL 8:00 PM CST.	2245
TORNADO WARNING	WARNING ISSUED FOR ARMSTRONG, CARSON AND GRAY CO OF TEXAS PANHANDLE EFFECTIVE UNTIL 6:30 PM CST.	2250

TABLE 2. CONTINUED.

<u>EVENT</u>	<u>LOCATION</u>	<u>TIME (GMT)</u>
RAIN	RAINFALL AMOUNTS FOR THE PORT ARTHUR, TEXAS AREA SINCE 7:00 AM CST: EVADALE-2.8 INCHES, KOUNTZE-1.2 INCHES, SOUR LAKE-3.7 INCHES, WAREN-1.1 INCHES.	2315
HAIL	1 INCH HAIL REPORTED AT CLAUDE, TEXAS AND GOLFBALL SIZE HAIL REPORTED JUST S OF GOODNIGHT, TEXAS.	2330
RAREP FTW	TRW WITH HEAVY RAIN OBSERVED OVER S PART OF FORT WORTH, TEXAS AT 5:30 PM CST.	2335
RAREP SAT	SVR TRW LOCATED 35 MI E OF VICTORIA WITH RAINFALL RATES OVER 2 INCHES PER HR AND WITH SMALL HAIL, MOVING E AT 15 MPH. MAX TOP TO 44,000 FT.	2335
SVR TRW WARNING	WARNING ISSUED FOR DEWITT AND LAVACA CO OF TEXAS, EFFECTIVE UNTIL 6:40 PM CST.	2340
FUNNEL CLOUD	FUNNEL CLOUD TOUCHED DOWN BRIEFLY IN SW HOUSTON, TX.	2340
TORNADO WARNING	WARNING ISSUED FOR DONLEY CO, TEXAS EFFECTIVE UNTIL 7:00 PM CST.	0005
SVR TRW WARNING	WARNING EFFECTIVE UNTIL 7:00 PM CST FOR HARRIS CO, TEXAS.	0005
FLASH FLOOD WARNING	WARNING ISSUED FOR WILLIAMSON AND MILAM CO OF TEXAS. 2 TO 3 INCHES OF RAIN HAS FALLEN ON THE N AND S FORK OF THE SAN GABRIEL RIVER.	0010
RAIN	INDICATORS SHOW THAT UP TO 4 INCHES OF RAIN HAVE FALLEN IN THE PAST 3 HRS IN N KARNES CO, TEXAS.	0015
HOOK ECHO	HOOK ECHO ON AIRCRAFT RADAR OVER CDS.	0030
SVR TRW WARNING	WARNING EFFECTIVE UNTIL 8:00 PM CST FOR COLORADO AND WHARTON CO OF TEXAS.	0035
RAREP SAT	VERY HEAVY TRWS 30 MI W OF VICTORIA WITH RAINFALL RATES IN EXCESS OF 2 INCHES PER HR. MOVEMENT TO E AT 20 MPH. MAX TOP TO 45,000 FT.	0035

TABLE 2. CONTINUED.

<u>EVENT</u>	<u>LOCATION</u>	<u>TIME (GMT)</u>
TURBULENCE	SVR TURBULENCE ENCOUNTERED BY AIRCRAFT OVER HOUSTON, TEXAS.	0045
TURBULENCE	SVR TURBULENCE OVER DENVER REPORTED BY AIRCRAFT.	0050
RAREP LCH	SOLID RAIN WITH TRWS IN THE RAIN COVERED ALL OF W AND SW LOUISIANA AND SE TEXAS.	0050
RAREP SEP	VERY HEAVY TRWS IN AND N OF FORT WORTH AREA MOVING N AT 20 MPH. MAX TOPS TO 42,000 FT.	0050
RIME ICE	RIME ICE ON AIRCRAFT AT 11,000 FT OVER SHREVEPORT, LOUISIANA.	0114
SVR TRW WARNING	WARNING EFFECTIVE UNTIL 8:30 PM CST FOR VICTORIA CO OF TEXAS.	0125
HAIL	3/4 INCH HAIL REPORTED IN THE SHADY OAKS SUBDIVISION ON THE GOLIAD HIGHWAY, IN TEXAS.	0125
RAIN	RAINFALL TOTALS UP TO 3.6 INCHES HAVE OCCURRED OVER SW HOUSTON UP TO THIS TIME.	0130
FUNNEL CLOUDS	FUNNELS REPORTED W OF WHEELER, TEXAS.	0145
HAIL	PEA SIZE HAIL REPORTED IN BEAUMONT, TEXAS.	0145
SVR TRW WARNING	WARNING EFFECTIVE UNTIL 9:00 PM CST FOR VAL VERDE CO, TEXAS.	2110
TORNADO WATCH	WATCH IN EFFECT FOR CENTRAL AND SW KANSAS, NW OKLAHOMA AND NE TEXAS PANHANDLE.	0217
TORNADOES	TORNADOES SPOTTED IN HILL CITY, KANSAS, BARTLETT AND FRANKLIN, NEBRASKA, AND HOUSTON, TEXAS.	0217
SVR TRW WARNING	WARNING EFFECTIVE UNTIL 10:00 PM CST FOR EDWARDS AND KINNEY CO OF TEXAS.	0240
FLOOD WARNING	WARNING FOR SIM'S BAYOU AND BUFFALO BAYOU, TEXAS.	0309
FLASH FLOOD WARNING	WARNING EFFECTIVE UNTIL 12:00 AM CST FOR BEAUMONT, TEXAS.	0315
RIME ICE	AIRCRAFT REPORTS RIME ICE OVER DENVER, COLORADO.	0320

TABLE 2. CONTINUED.

<u>EVENT</u>	<u>LOCATION</u>	<u>TIME (GMT)</u>
FLASH FLOOD WARNING	WARNING EFFECTIVE UNTIL 12:30 AM CST FOR LIBERTY, HARRIS AND BRAZORIA CO OF TEXAS.	0340
RAREP SAT	SVR TRWS IN CENTRAL AND N KINNEY CO., TEXAS WITH HAIL AND RAINFALL RATES IN EXCESS OF 2 INCHES PER HR INDICATED. TOPS TO 50,000 FT.	0340
SVR TRW WARNING	WARNING ISSUED FOR REAL AND UVALDE CO OF TEXAS EFFECTIVE UNTIL 11:00 PM CST.	0342
FLOCO STATEMENT	RECORD FLOODING EXPECTED ON PINE ISLAND BAYOU.	0430
FLASH FLOOD WARNING	WARNING IN EFFECT UNTIL 2:00 AM CST FOR PALO PINTO CO, TEXAS.	0435
HAIL	GOLFBALL SIZE HAIL REPORTED IN UVALDE CO, TEXAS.	0450
SVR TRW WARNING	WARNING ISSUED FOR FRIO CO, TEXAS EFFECTIVE UNTIL 12:30 AM CST.	0510
FLASH FLOOD WARNING	WARNING ISSUED FOR JACK AND COLLIN CO OF TEXAS EFFECTIVE UNTIL 2:00 AM CST AND PARKER AND WISE CO OF TEXAS, EFFECTIVE UNTIL 1:00 AM CST.	0525
FLOODING	ALL CITY STREETS IN BEAUMONT, TEXAS ARE UNDER WATER.	0530
RAIN	11.5 INCHES OF RA'N REPORTED NW OF BEAUMONT SINCE 5:00 PM CST.	0530
SVR TRW WARNING	WARNING EFFECTIVE UNTIL 2:00 AM CST FOR LASALLE AND ATASCOSA CO OF TEXAS.	0635
SVR TRW WARNING	WARNING ISSUED FOR BEXAR AND MCMULLEN CO OF TEXAS EFFECTIVE UNTIL 2:00 AM CST.	0720
SVR TRW WARNING	WARNING EFFECTIVE UNTIL 4:00 AM CST FOR LIVE OAK, DUVAL, BEE, JIM WELLS, AND SAN PATRICIO CO OF TEXAS.	0815
RAIN	OVER 2 INCHES OF RAIN RECORDED AT LAKE CHARLES, LOUISIANA IN PAST 3 HRS.	0935
FLASH FLOOD WATCH	WATCH HAS BEEN EXTENDED FOR SE TEXAS THROUGH TODAY. AREA IS THAT PORTION OF S TEXAS ALONG AND E OF A LINE FROM COLLEGE STATION TO PALACIOS.	1030

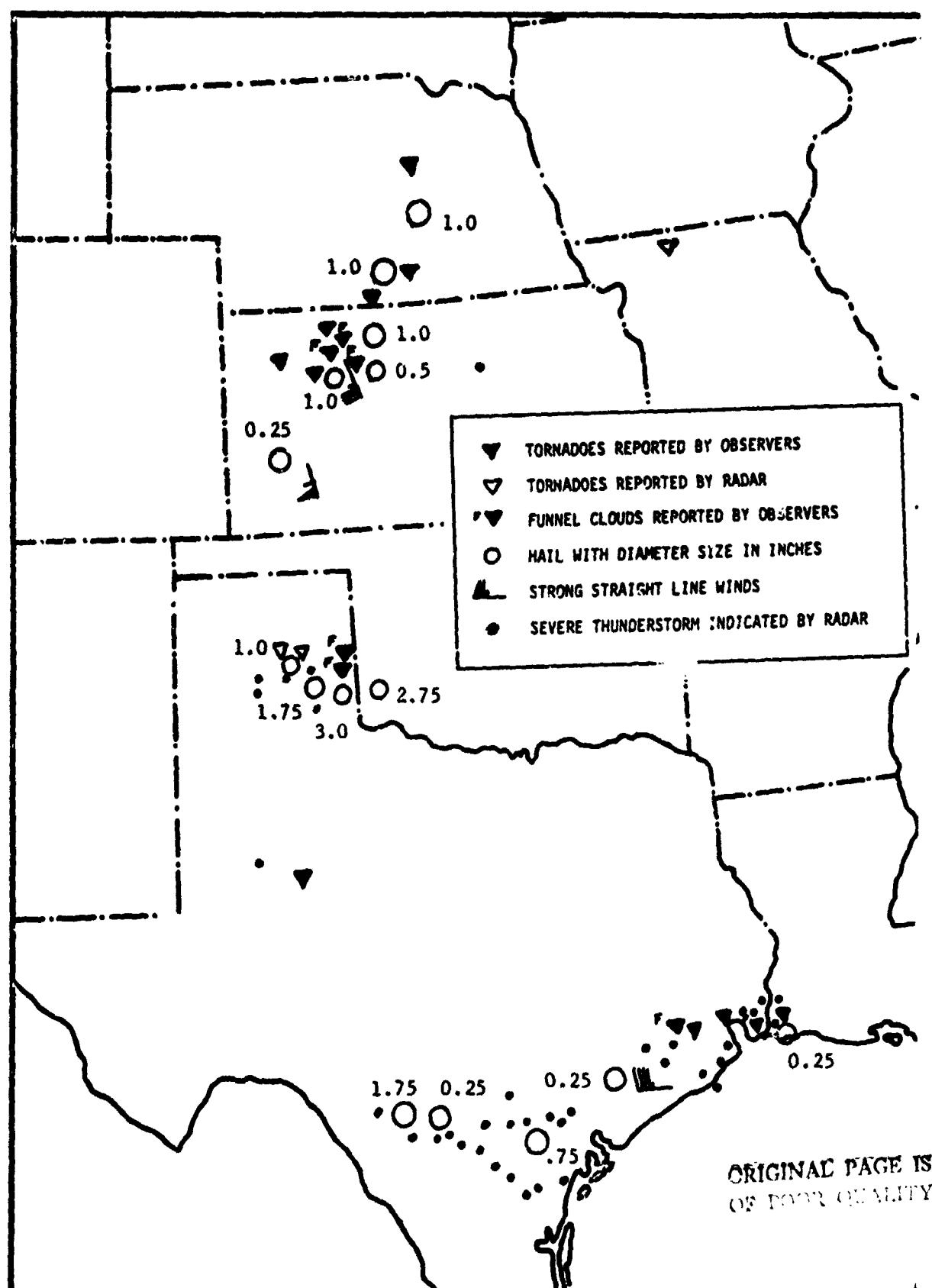


Fig. 48. Severe weather reports between 1200 GMT 19 April and 1200 GMT 20 April 1979 in the AVE-SESAME II area.

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**Alberty, R. L., D. W. Burgess, C. E. Hane, and J. F. Weaver, 1979:
SESAME 1979 Operations Summary. U. S. Department of Commerce,
Boulder, 253 pp.**

APPROVAL

A PRELIMINARY LOOK AT AVE-SESAME II CONDUCTED
ON 19-20 APRIL 1979

By Steven F. Williams, Nicholas Horvath, and Robert E. Turner

The information in this report has been reviewed for technical content. Review of any information concerning Department of Defense or nuclear energy activities or programs has been made by the MSFC Security Classification Officer. This report, in its entirety, has been determined to be unclassified.

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